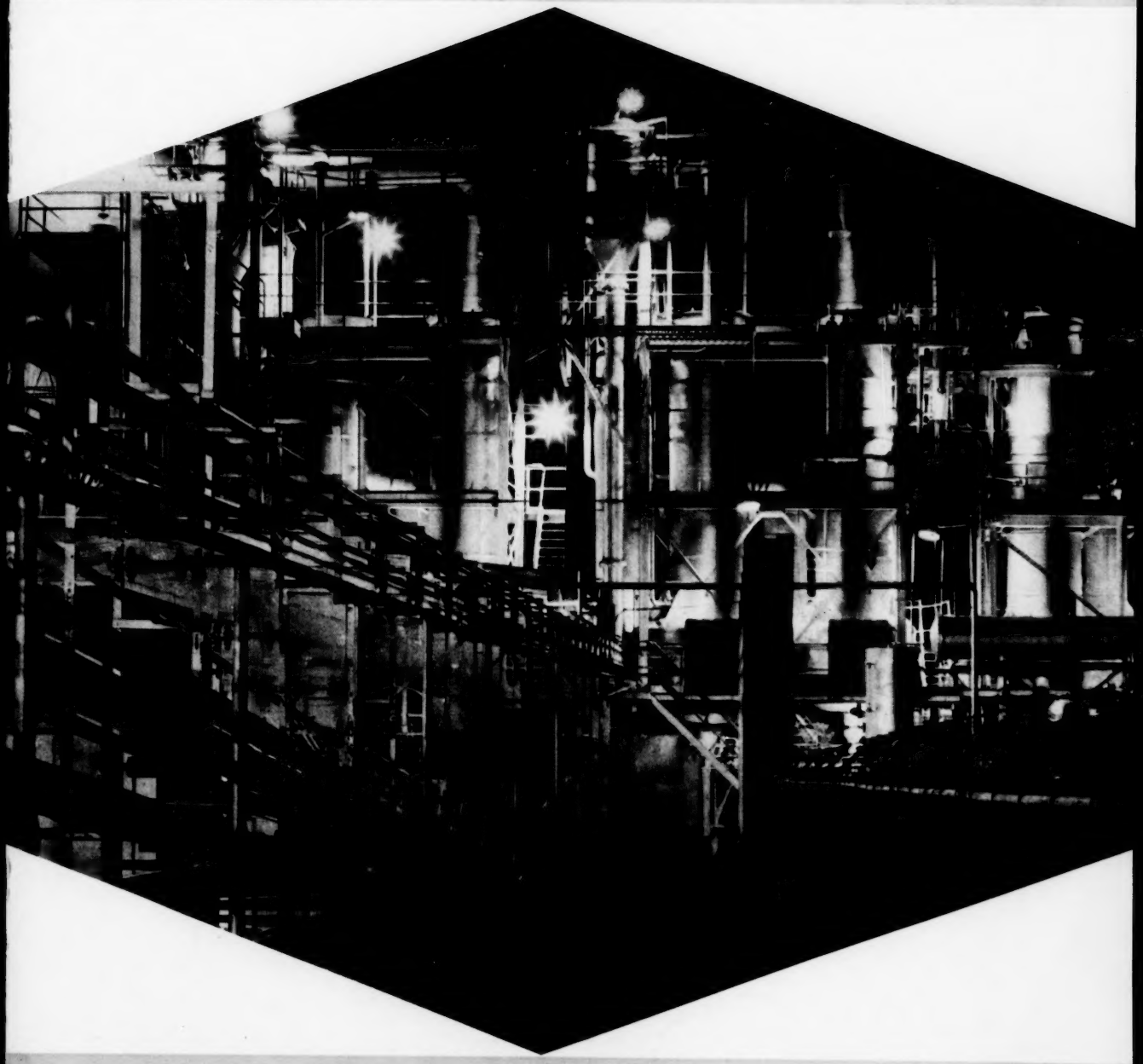
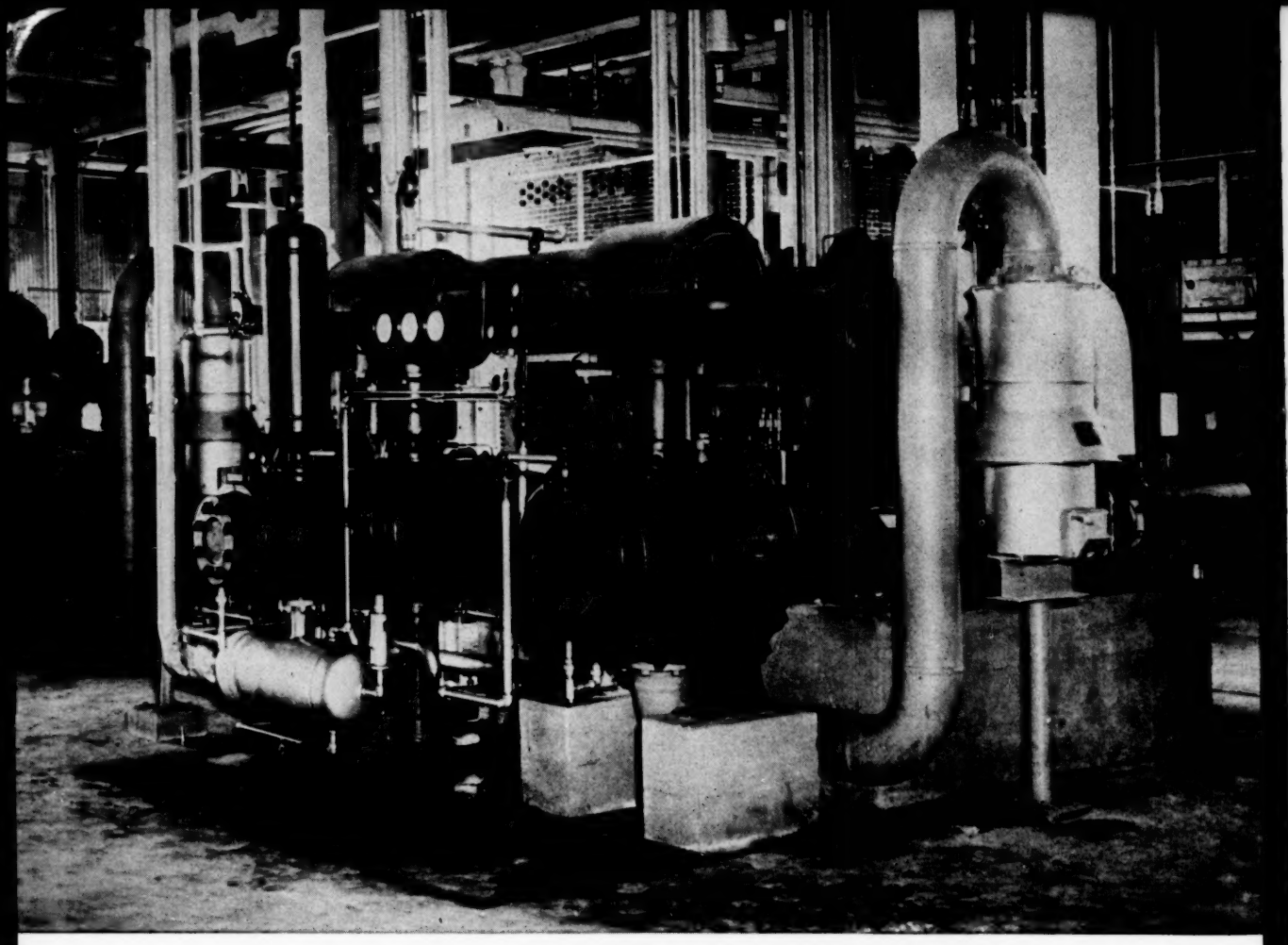
INDUSTRIAL REFRIGERATION

July, 1958

Vol. 135, No. 1



Evaporation by Refrigeration—Page 3



Performance is always dependable... when the lubricant is Texaco Capella Oil Waxfree

Keep refrigeration compressors running smoothly and at top efficiency for long periods of time with Texaco Capella Oil Waxfree. You'll save a lot on maintenance costs.

Texaco Capella Oil Waxfree assures clean compressor performance. Even at temperatures as low as minus 100°F., for instance, waxout does not occur in systems where a miscible-in-oil refrigerant is used. Haze and floc temperatures are exceptionally low. Texaco Capella Oil Waxfree is highly stable, does not foam, and is compatible with all refrigerants. It also has outstanding resistance to oxidation.

A complete line of Texaco Capella Oils Waxfree meets the specifications of all leading compressor manufacturers. It is readily available in 55-gallon and 5-gallon drums, and in 1-gallon cans. The more popular grades may be purchased in 1-quart containers. All are refinery-sealed to protect the high quality and purity.

Ask a Texaco Lubrication Engineer to help you select the proper lubricant for your system. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, New York.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

2 MORE IMPORTANT CONTRIBUTIONS TO THE REFRIGERATION INDUSTRY

Designed and Pioneered by ALCO

1 ***The new Alco designed CONTOUR POWER ASSEMBLY***

Reduces extreme and unnecessary flexing of the diaphragm. Increases diaphragm life as much as 10 times over other designs. Standard construction on all ALCO "T" Series and "HTL" Valves.

2 ***The new Alco designed RAPID RESPONSE REMOTE BULB & WELL***

- Reduces danger of floodback
- Extra-quick closing response
- Better control over wider range of operating conditions
- Economical to install in package units
- Available on all Alco Gas Charged Valves if specified.

Look to Alco for advances in refrigerant controls.

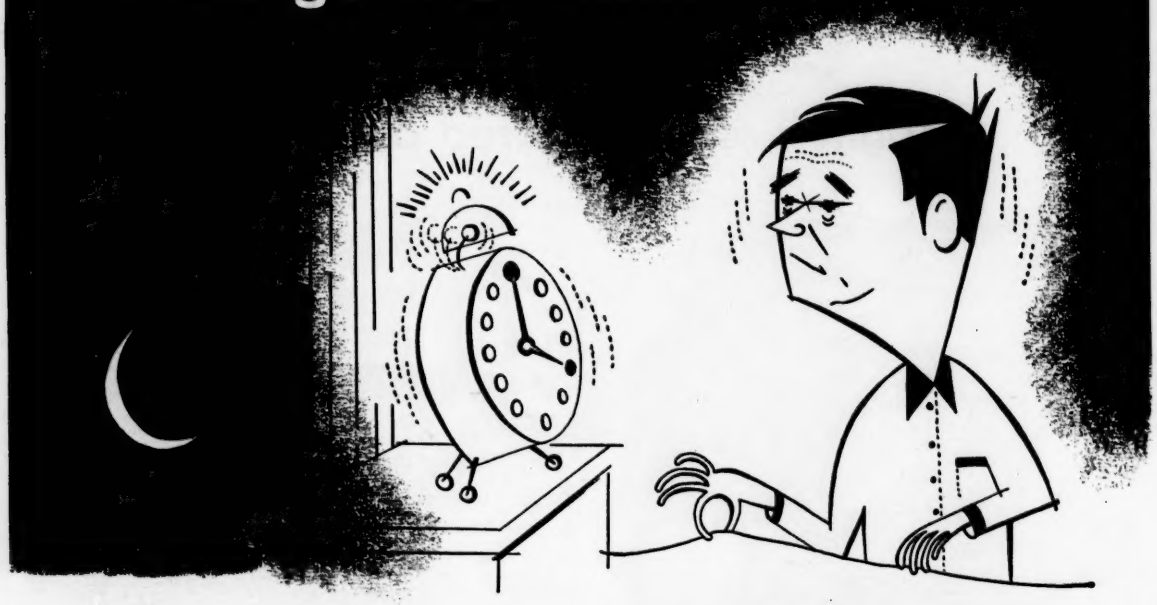
Call your Alco wholesaler.
Write for Bulletin No. 171-4.

- *BUY SECURITY*
- *BUY QUALITY*
- *BUY ALCO*

7890

The one complete line of refrigerant controls: Thermostatic Expansion Valves • Refrigerant Distributors Solenoid Valves • Suction Line Regulators • Flooded Evaporator Controls and Reversing Valves

He Used to Get Up at 4 A.M. To Purge the Plant



...Before Installing an ARMSTRONG PURGER

Maybe this is an extreme case, but it's a true example of the inconvenience that is caused—in one way or another—by hand purging.

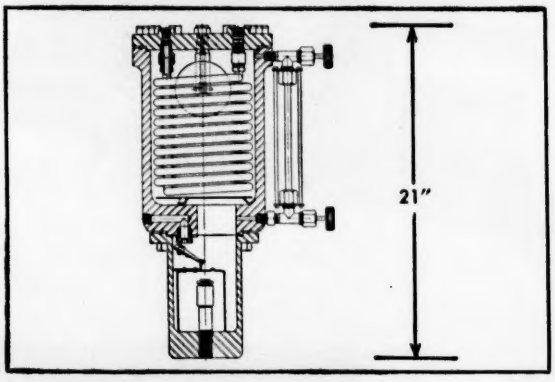
The engineer of a midwestern dairy used to get up at 4 A.M. whenever the refrigeration system needed purging, so that he could get the job done before starting up the plant for the day's work. He couldn't purge manually while the system was in operation without losing excessive amounts of refrigerant. Now, with an Armstrong purger, he can purge while the plant is in operation. And he devotes practically no time to the job—once he turns on the purger, it's completely automatic!

And he's cut operating costs, besides. The Armstrong purger takes *all* the air out of the system. Head pressures have been reduced 20 lbs., cutting power costs 10% and increasing capacity 5%. Less cooling water is consumed because the insulating blanket of air has been removed. And ammonia loss, once a costly item, has been cut to a negligible 2 lbs. per month.

The results in this case are not unusual, although the type of inconvenience may be. In case after case, Armstrong purgers have given similar benefits. So sure are the results, in fact, that you can now get one on a *30-day trial offer*. If you're not completely satisfied, your money will be refunded in full.

Why not find out more? Get the bulletin described at right—just use the handy coupon.

ARMSTRONG MACHINE WORKS
8604 Maple Street • Three Rivers, Michigan



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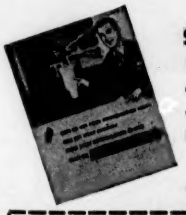

SEND FOR BULLETIN

Bulletin No. 2212 tells more about the benefits of efficient purging; gives physical data, price, and explanation of operation of Armstrong No. 370 Purger.

To get your free copy, just fill in the coupon and mail it today.

ARMSTRONG MACHINE WORKS
8604 Maple Street, Three Rivers, Michigan

Send me a copy of Bulletin 2212.

Name_____

Clip to company letterhead and mail.

July, 1958

Number 1

Vol. 135

Industrial Refrigeration

Now in its 67th Year of Publication

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The Cover:

▶▶▶ "Tempest in Six Cylinders" was the adept title used by the Editor of Libby, McNeill and Libby's house organ, THE SCANNER, in describing the Lo-Temp system of evaporation accomplished by apparatus at Libby's Ocala, Florida plant. Under the high vacuum, low temperature system the juice actually boils furiously at a temperature between 70 and 75 F. As THE SCANNER describes, it takes only a few seconds to reduce juice from its original volume to a sherbet-like concentrate.

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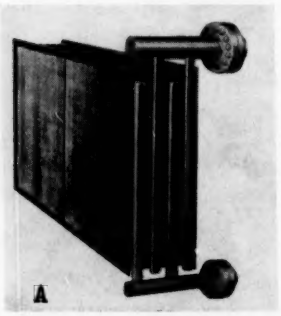
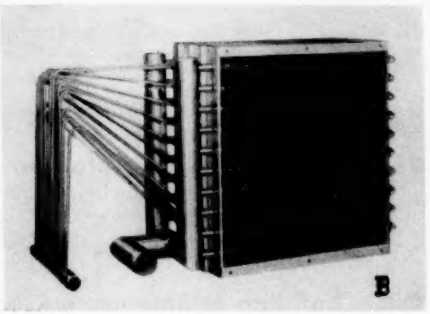
What's New

MACHINERY
APPLIANCES • PROCESSES

Environmental, Heavy Duty and High Pressure Evaporative Surfaces Recently Introduced



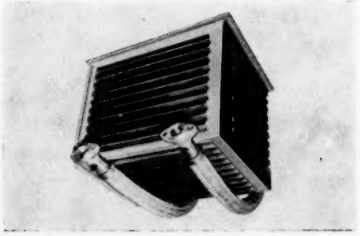


New Uses of Steel Fin Coils

▸▸FOR TESTING various engine parts in the guided missile, aircraft and automotive fields, many firms today employ autoclaves in which metal parts are either heat treated or tested at elevated temperatures. When internal chamber temperatures do not exceed 1000° F, it is possible to employ a steel fin coil through which a high temperature fluid, such as Dowtherm, is circulated. Photo A shows this type of heating coil, designed by a Chicago firm with the full consideration of the linear stress that the coil will be called upon to sustain.

Photo B illustrates type of coil designed for use in environmental chamber service. This coil must adapt itself to rapid temperature changes from 75° below to 1000° above zero, F. This unit is used to reduce temperature in a chamber from 900° F down to ambient and employs tap water as the coolant. The feeder tubes on supply headers are intended for flexibility as the sudden application of water, which flashes into steam, results in immediate contraction throughout the coil system. Rempe continues also, its heavy duty ammonia line.

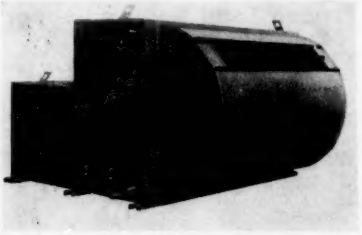
High Capacity Exchangers



▸▸DEVELOPMENT of standard and custom-designed high capacity heat transfer surfaces has been announced by a leading New Jersey producer. Equipment is designed to operate under reduced pressure with a high degree of heat exchange for cooling purposes.

Already widely used in the aircraft and electronic industries, the new heat transfer surfaces are expected to find increased utility in a wide range of industrial applications as evaporators and condensers.

High Pressure Air Units

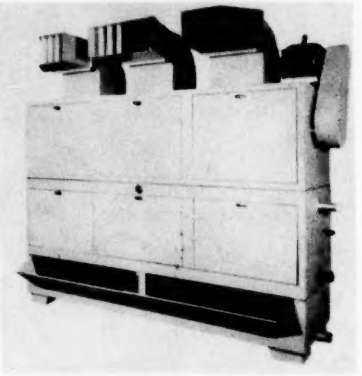


▸▸SPURRED by recent, heavy orders for air conditioning equipment for multi-storied buildings (old and new) a Los Angeles air conditioning manufacturer announces its entry into the field of high-pressure equipment design and manufacture. First in the new line is a high pressure hot and cold deck air handling unit. Capacities range from 5,000 to 25,000 cfm, up to 8-in S.P.

Features include dual fans, internal vibration isolation of fans and motors, high pressure construction.

Heavy Duty Coolers

▸▸UNIT coolers for such heavy duty refrigeration applications as food processing, packing houses, refrigerated warehouses, produce storage and meat purveying industries have been introduced by Refrigeration Appliances, Inc. in a series designed for use with halo-carbon and ammonia refrigerant for above or below freezing temperature, and capacities ranges of 1200 to 27,000 Btu/hr/° TD.



Designed for floor mounting, the hot dipped galvanized or low temperature enamel finished equipment will deliver from 4,000 to 28,000 cfm. Also introduced by this manufacturer of the well known Krack line, is a series of larger ceiling hung unit coolers for produce marketing, wholesale meat and dairy industries.

Brown Offers a "Junior"

▸▸MEETING the demand for automatic ice cube vendors more adaptable to various types of businesses and locations, the K. G. Brown Manufacturing Co. Inc., has added the "Junior" to their line of vending stations. This new, simplified mechanical merchandiser fits the small, choice location, as it measures only 3 feet wide, 7 long and 6 high. Yet it vends sixty 10-pound bags at a filling, and has storage reserve of 30 additional packages.

Another Ice Cuber Marketed

▸▸UNVEILED in Chicago on the first day of spring was a new ice cuber capable of producing 400 tons of ice cubes per day.

User of this type ice cuber simply chooses any number of head units he desires to meet his daily requirements and the manufacturer fabricates them with companion storage bins.

FREE! CADDY-WRENCH

from June 1 to August 1 with the purchase of any cylinder of genetron® 22

It's a wrench!
Fits "Genetron" cylinder valve stems and valve outlet caps—also fits stems of compressor service valves, soldering gas cylinders, etc.

Comfortable finger grips

¼" tool steel, smooth plated finish

It's a carrying tool! Fits bonnet hole on small "Genetron" cylinders

Here's a tool you've never seen before—specially designed for the service engineer by General Chemical. It's a combination carrying tool and wrench. We call it a "Caddy-Wrench." And, like the "Jug-a-Lug" which we created for you two years ago, this is a tool that's really helpful, really useful.

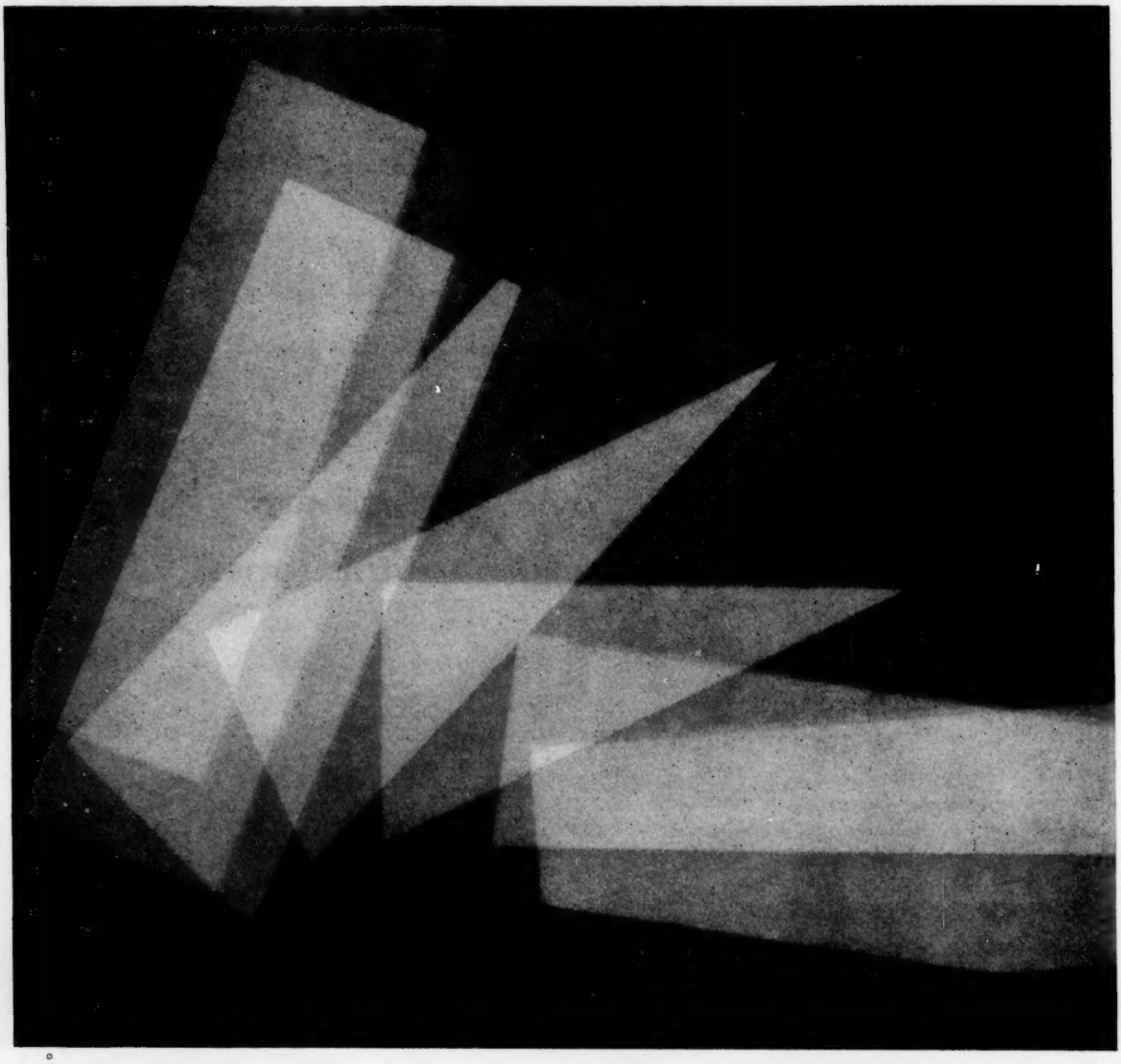
Many uses! As a carrying tool, the "Caddy-Wrench" makes it easy to carry small size cylinders by the hood. *No more cuts, strains and finger injuries!* And as a wrench, it's designed to fit "Genetron" cylinder valve stems and valve outlet caps, also stems of compressor service valves, soldering gas cylinders, etc. *No more adjusting wrenches or using different tools, once you have this all-purpose cylinder wrench and carrying tool!* Made of quarter-inch solid tool steel, it's strong, sturdy, won't crack, bend or break. And the smooth plated finish makes it a pleasure to use. Be sure you get *your* "Caddy-Wrench"! *Here's the only way to get one:*

SEE YOUR WHOLESALER! When you buy any size cylinder of "Genetron" 22—*between June 1 and August 1 only*—your wholesaler will be glad to give you your "Caddy-Wrench" . . . *free!*

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, New York

CLOSE-UP OF A MODERN COLD ROOM INSULATION



Resilient new Armstrong Armalite

provides joints that stay tight at any cold room temperature

Here's one foamed plastic insulation that's resilient—not rigid. Armalite has "bounce." During installation it will "give" slightly under pressure – allows compression fit. That means heat-tight joints that stay tight no matter how cold the room interior. In service, contraction that may take place at low temperatures is compensated for by the "spring back" of the compressed Armalite.

Actual shrinkage of Armalite is negligible – only about half as much as some rigid foamed boards. Other advantages include high insulating efficiency, light weight, high strength, good moisture resistance . . . all at a reasonably low cost.

These are just the highlights. For details, send today for the free folder, "Armstrong Armalite." Write to Armstrong Cork Company, 2107 Skye Drive, Lancaster, Pa.

Armstrong INSULATIONS

news briefs of the month

54th Annual ASRE Meeting

Officers elected by an earlier mail ballot, assumed their duties on Monday June 23 at the 54th Annual ASRE meeting held in Minneapolis, Minn. President Cecil Boling, 1st Vice-President D. D. Wile, 2nd Vice-President R. H. Tull, and Treasurer F. Y. Carter were presented at a welcome luncheon at the Leamington Hotel by Hermann F. Spoehrer, retiring president. Earlier in the morning, Council of the Society had submitted to the members present a proposal that a plan for merger of ASRE with ASHAE be submitted to the membership at the Fall meeting of the society.

Industrial Air Conditioning To Include Heat Pump

Heat pumps will be included in all industrial installations of air conditioning by 1963, according to an executive of one of the largest manufacturers of this type of equipment and electrical apparatus. The statement was made at a Spring sales conference of Edison Electric Institute. The meeting brought out information that cooling cost per ton had dropped from $700.00 to $450.00 in a little over three years time, and numerous successful applications had been made in more northerly climates. There are 26 manufacturers active in this field.

Cheese Warehouse

Milwaukee Cheese Company will build a warehouse and office at Brookfield (Milwaukee) Wisconsin, with work to start about mid-year 1958. Cost of the construction is estimated at more than $600,000.00 according to Henry J. Zwicky, president. Floor space will be 100,000 sq. ft.

Reefer-Truck Standards From ARI by Fall

Formed earlier in the year, the Mobile Section of the Air Conditioning and Refrigeration Institute, has recently announced that a standard for testing and rating truck and truck-trailer refrigeration equipment is expected by early Fall. Announcement was made by George S. Jones, Jr., Managing Director, ARI, and Henry O. Kirkpatrick, Chairman of the Mobile Section. The Mobile Section, one of 15 product sections of ARI, was organized after a series of meetings of manufacturers of refrigeration equipment for truck, truck-trailer and railway cars.

Independent Packers

Officers for the 1958-59 term of National Independent Meat Packers Association elected at their Spring meeting are President and Chairman of the Board, T. H. (Ted) Broecker, Chairman of Board, The Klarer Co.; Honorary Chairman and retiring president, Chris E. Finkbeiner, president Little Rock Packing Co.; 1st vice-president, J. B. Hawkins, general manager, Lykes Bros. Inc.; 2nd vice-president, Floyd A. Segal, vice-president, Wisconsin Packing Co.; treasurer, W. L. Medford, president, Medford's, Inc.; executive secretary, John A. Killick.

Electronics Unreliable

Electronics play the key role in automation. Unfortunately electronics are particularly unreliable. So said Robert Lusser, Reliability Coordinator, Redstone Arsenal, Alabama, in addressing the Institute of Environmental Engineers in April. Backing up his statement with actual statistics, the speaker indicated that the powerful concepts of reliability control employed in structures and machinery, should be employed in electronics also.

Canadian Warehousemen

J. N. Shortliffe, Edmonton, was named president of the Canadian Warehousemen's Association at its 38th annual convention just concluded at the Seigniory Club, Montebello, Quebec. He succeeds E. P. Carr of Toronto. The association, representing owners and managers of public warehouses throughout Canada, held its largest conference to date, with speakers attending from Great Britain and the United States.

LOST

space in your building

FOUND

with

KRAMER

OUTDOOR COMPRESSOR

Why lose dollar-making storage and selling space to house compressors, when you can now use the Kramer Outdoor Compressor? The THERMOBANK COMPRESSOR SYSTEM is factory assembled, tested and run-in; it saves installation time and money.

The refrigeration industry again finds Kramer blazing a new path with its THERMOBANK SYSTEM—the original and only automatic re-evaporating, non-overloading, fastest hot gas defrost system—now engineered to perform unfailingly, not only in a heated space but in any unheated space or outside at any outdoor temperature.

WRITE FOR BULLETIN TC 406A

KRAMER TRENTON CO. Trenton 5, N. J.

45 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER

Ill Weather Blows In New Citrus Concentrate Process

▶▶▶ESTIMATES of damage done to Florida citrus crop when a very unwelcome visitor, an unusually severe Old Man Winter, dropped in during December, January and February, have been estimated at from 20 to 30 percent reduction in total available product in 1958. From all indications it will even affect '59 and '60 product. The cold weather hurt many of the trees.

Although stocks on hand of frozen concentrate was up at the end of 1957 season over previous years, the freezing weather which played havoc during the winter months was expected to reduce the available concentrate for 1958 by approximately 25 percent. Speculation in late Winter and early Spring months at marketing points brought about advancement in retail prices in Chicago of about 6 to 7 cents per 6-oz. can.

New Processes Result

Weather damage did bring about improved methods in processing concentrate. Freeze damaged fruit had not previously been used in processing citrus concentrate. It was reported that the Florida Citrus Commission at first ruled that no more than 5 percent of the fruit showing frost damage could be used in the manufacture of concentrate.

Processors, however, were quite certain that more of the fruit could be used. They packed and stored the product in special containers at minus 10F. New processes were introduced by Minute Maid, and Libby, McNeill and Libby.

Restrictions Eased

About the end of the year regulations were such that all processors were permitted to use up to 15 percent damaged fruit and early in 1958 the tolerance was 25 percent. Progress made such satisfactory strides that up to but not more than 50 percent is allowable.

USDA laboratories and those of the various processors turned-to on a bigger job than any they had previously faced. Food technologists on these lab staffs have not disclosed in detail as yet their new process developments. But as a result of their efforts, packers turned out top quality merchandise which in the past would probably have been written off as a loss. Refrigeration, of course, on industrial tonnage scales, played a big part in the minus temperature storage of the frost-nipped fruit, and later in the processing of concentrate and its storage.

Security Ownership Changes

▶▶▶REFRIGERATED Food Services, Inc., acquired Security Warehouse and Cold Storage of San Jose and Santa Clara, Calif., through purchase of outstanding stock. The plants of Security, located in San Jose and Santa Clara, will continue operation under the same name. Glenn F. Dodson will continue as president and there will be no change in the present staff.

Refrigerated Food Service, Inc., is owned by Merchants Refrigerating Co. of New York City. The announcement of the Security acquisition came from Arthur N. Otis, president of Merchants. John Q. Patton, principal stockholder and founder of Security becomes a director of Merchants.

Widens Scope of Services

Facilities at San Jose and Santa Clara will further diversify Merchants investments as well as operations in producing areas. With these two additions, Merchants now operates 11 refrigerated warehouses from coast to coast; two each in New York City and in Buffalo, New York, and one each in Jersey City and Newark, New Jersey, Vinita Park, Mo., Hopkins, Minn., and Modesto, San Jose and Santa Clara, California.

Security processes much of the Santa Clara Valley fruit crop, including cherries, strawberries, apricots, pears and a wide variety of vegetables. It is one of the leading refrigerated warehouse freezing operations, and a large portion of the Valley's total yield is frozen and stored in Security's plants or pre-cooled there and loaded for shipment to consumer markets. The two plants have nearly four million cubic feet of storage space and a daily freezing capacity of 500 product tons.

Rock Martinis

▶▶▶FROZEN FOOD departments in the supermarket of the future may display liquor licenses. PACKAGING PARADE NEWSLETTER came out in March with dispatches from the NAFFP convention which were copied by a number of daily newspapers, one of which was an idea for widening the frozen food line with frozen martinis. Instead of a martini on the rocks, it is supposed that a customer would help himself to a few rock martinis from the frozen food case. Used in marketing frozen veal scallopini, frozen wine has also been successfully tried on martinis and manhattans. Wine having an alcoholic content does not freeze solidly but it does come out half-frozen, or as one daily press reporter called it "half-stiff".

NARW Activities Step Up Their Tempo

▶▶▶NEW ACTIVITIES planned by four major committees were announced early in June by the National Association of Refrigerated Warehouses, Inc. Adding to their present scope of work were safety, warehouse operations, cost and insurance committees. Other standing committees carrying on with present activities are government affairs and industrial relations.

Additional activities assigned standing committees are designed to help NARW members keep up to date on newer techniques. The programs have developed at recent committee meetings held especially for this purpose.

With the announcement of increased work tempo, NARW President Philip G. Kuehn named the following committee chairmen:

Safety Committee—
A. R. Carstensen, Sac'to

Warehouse Operations
(Storage & Handling)
A. C. Bowen, Jr., Nashville
(Const'n, Maint. & Repair)
P. B. Christensen, Portland, Maine

Cost Committee—
F. D. Newell, Jr., Minn.

Insurance Committee—
E. E. Hesse, Chicago

Government Affairs Committee—
G. J. Stecker, Louisville

Industrial Relations Committee—
P. V. Henningsen, Portland, Oregon

Safety Program

The safety committee has embarked on a new poster program coupled with a bulletin series. They are undertaking assistance with safety problems in addition to the continued promotion of color coding, and employee and plant awards. Warehouse operations committee, both divisions, have planned additions to the NARW Operations Manual.

Cost committee plans a series of releases which will include a study of actual receiving and delivery costs, aids and suggestions. The insurance committees will investigate a proposed group fire insurance plan in addition to keeping an eye on the legal liability and insurance situation.

Recent releases of the warehouse operations committee has included bulletins on re-refining and re-use of oil recovered from ammonia refrigeration systems, by P. J. Morrisey, San Jose, Calif.; Water Treatment by A. F. Christensen, Chicago; Tempering Cooler Commodities for Shipment by C. E. Olson, Omaha, Nebr.

ENVIRONMENT ROOMS

Special Release
To *Industrial Refrigeration*

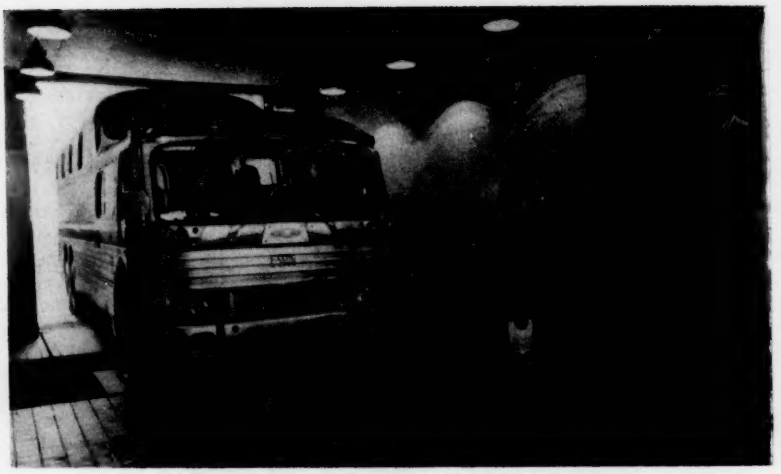


Fig. 1. Cool reception awaits this Greyhound "Scenicruiser" pulling into Gulf Research and Development Company's environmental test facility at Harmarville, Pa., for fuel and lubricant performance studies.

REFRIGERATION–TEST TOOL

▶▶▶ AUTOMOTIVE engineers at Gulf's Research Laboratories, a few years ago, found themselves in somewhat the same position as many a modern homemaker. Just as numerous housewives long for a new, giant 14-cubic-foot refrigerator to meet the needs of their growing families, the Gulf scientists longed for a bigger "cold room" to meet the needs of their growing research studies of gasoline and lubricant performance under all-weather conditions. But the Gulf men were not thinking in terms of a 14-cubic-foot unit, or even a walk-in refrigerator. What they needed, and what they now have is a 10,000-cubic-foot "drive-in refrigerator", big enough to house a vehicle as large as a transcontinental bus!

This drive-in room is one of three cold rooms that are a part of the impressive, new Automotive Products Laboratory dedicated last year as part of the Gulf Research & Development Company's Harmarville (Pa.) Laboratories. The other two rooms are of standard test-cell size, designed to accommodate an automobile or truck engine mounted on a test stand. All three of the rooms can be cooled to a temperature of minus 70 F. Moisture content of the air in the rooms can also be regulated to produce most any desired humidity.

Small cold rooms are equipped with "test-stand" dynamometers, and the large room, with a chassis dynamometer. With the former equipment, it is possible to simulate a great variety of operating conditions on a test engine. The chassis dynamometer does essentially the same thing, only more so. Utilizing the principle of the treadmill, it can accommodate an entire vehicle and closely duplicate actual road conditions, making it possible to carry out miles of "road" testing in the laboratory without having the car move one foot!

Combines Hp Test Facility With All-Weather Room

Chassis dynamometers are not new in automotive research. In fact, the G.R. & D. Co. has had one in operation since 1946, and a second one was added in 1948. These, however, are not commonly installed in cold rooms. As with the earlier models, the only obvious features of the new dynamometer in the test room are the curved sides of two drums protruding slightly above floor level at one end of the room. The bulk of the elaborate equipment is in the basement below the test room.

In operation, an automobile—or truck, or bus (see Fig. 1)—is driven into position with its rear wheels on the drums and its front wheels locked in chocks to hold the vehicle motionless. As the driver starts the engine and puts the car in gear, the rear wheels begin to rotate, and, in turn, drive the drums. The drums, or tread wheels, which are four feet in diameter, in effect, serve as a steel-surfaced highway over which the vehicle can put in hundreds of closely controlled test miles without having to contend with traffic and the usual road hazards.

An operator at the control panel in the corridor can set up any desired situation to simulate actual operating conditions. The dynamometer can be regulated to make the engine do the same amount of work in turning the drums that it would have to do in moving the weight of the entire vehicle on a level road against the wind resistance it would encounter at any given speed. This amount of work (i.e., the load on the engine) can be increased or decreased to simulate uphill or downhill grades, or acceleration and deceleration.

A wind tunnel at the front of the room delivers a blast of air corresponding to the car's speed to produce the cooling effect that the air has on an engine on the road. (Adjustments to simulate conditions which would prevail in encountering a head wind or tail wind can also be made.) A battery of instruments on the operator's control panel (Fig. 2), as well as a duplicate set of instruments in the test room (Fig. 3) visible to the occupants of the car, measure and record the various performance characteristics of the car.

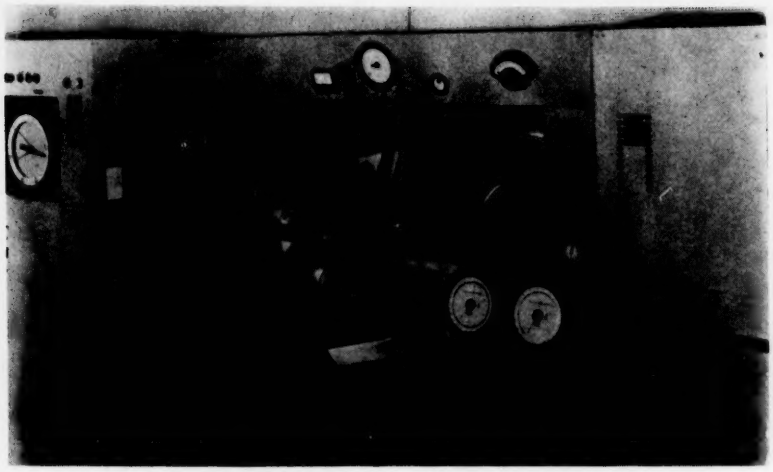


Fig. 2. Operator at the control panel, located in the corridor outside the drive-in refrigerator, communicates with research personnel in the test room while setting up any desired test situation.

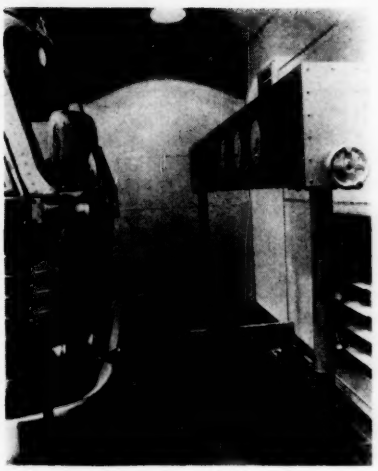


Fig. 3. Test data is recorded for vehicle occupants on the portable instrument panel pictured.

FOR AUTOMOTIVE RESEARCH

Latest improvements in chassis dynamometer design have been incorporated into the new installation. This fact, coupled with the all-weather air conditioning possible in the king-size cold room, promise to expedite greatly the work of engineers in gathering operating data, while substantially increasing the accuracy of such data.

Indirect Refrigeration

Heart of the all-weather conditioning system is a York two-stage refrigerating plant located in the basement of the building. The equipment consists of a series of Refrigerant 22 compressors totalling 350 horsepower. A secondary refrigerant, methylene chloride, is pumped from a central reservoir to the cooling coils in all three rooms. Automatic controls regulate the flow of coolant to each room, making it possible to operate all three simultaneously at different temperatures.

Hypothetical Problem Given

Suppose that a series of volatility tests are to be run on a gasoline in a bus operating under cold weather conditions. The tests are being conducted in the middle of July, and the thermometer reading outside is 90 F. In preparation for the tests, the 20,000-pound vehicle is moved into position in the room, the huge entrance doors are closed, and the air conditioner is started. Fans force air over the cooling coils and into the room through the tunnel opening.

Chilled air circulates through the room, cooling it, being drawn into a vent across the ceiling just inside the doors. It is then returned to the refrigerated coils through ducts, hidden by a false ceiling, to be recooled and recirculated (see Fig. 4). In such a manner, it would be possible to cool the room containing the bus from a temperature of 90 F. to 0 F in approximately two hours. In a total of 16 hours, the temperature could be reduced to minus 70 F.

In this situation, however, assume that part of the tests are to be run at about 40 F., at a high humidity. Once the controls are set, the air conditioner works automatically. Nozzles located behind the fan (see again Fig. 4), spray a mist of water into the blast of air to bring it to the desired relative humidity.

Asphixiation and Toxicity Protection Devices

As the engine is run, air is sucked from the room into the carburetor to burn the fuel. A hose connected to the exhaust pipe carries the dangerous combustion gases to a vent in the floor, and, thence, out of the cold room. As an added precaution, special safety devices, called "sniffers", are in constant operation, and sound an alarm if, for any reason, carbon monoxide or gasoline fumes begin to accumulate.

Double-dried Make-up Air

To replace air consumed in running the engine, fresh air is pulled into the room through a "make-up air system". Located on the floor above, the system consists of blowers; a refrigerated coil to chill the air and remove excess moisture; and a silica gel chamber, in which this drying agent strips the remaining moisture from the incoming air when extremely dry air is required. The make-up air is fed into the return ducts of the main cooling system (Fig. 4) and passes on thru the coiling coils, to be circulated into the room. And so the test proceeds, with the cold room making winter research studies possible in the peak of summer heat.

Summer Simulation

The "cold rooms" can also be used as "hot rooms" to make summer research studies possible in the peak of winter. In the well-insulated rooms, when the air conditioner is not in operation, the heat generated by an engine and the fan motor in the wind tunnel can quickly raise the temperature to a mid-July 100 F. When the desired "warm" temperature is reached, the air conditioner is started to hold the room at that point. Thus, with the humidity adjustments that can be made, it is possible to create any type of a hot-dry, or hot-humid climate.

Because of their great flexibility, no detailed list of specific projects will be conducted in the new cold rooms. Together, they are equipped to handle work on almost any type of special fuel and lubrication problem brought about by widely varying climatic and operating conditions. The value of having such research facilities can perhaps be more fully appreciated when it is realized that in Gulf's domestic marketing territory alone, products must perform equally well in the torrid summers of the Southwest, and in the severe winters of New England.

Tests Conducted On Road Conditioned Vehicles

In many cases, work will be initiated in the small cold rooms. These preliminary studies can be conducted on the many makes and models of test engines which the Company has available for such research. Then, as the project progresses, more comprehensive studies may be carried out on the chassis dynamometer.

Among the advantages of the chassis dynamometer is the fact that tests can be run on any automobile engine simply by driving the vehicle into position. While experiments in the small rooms are confined, generally, to test engines—which were purchased "factory new" and have seen only laboratory use—any number of "road conditioned cars" (recruited from Company fleets or from employees) can be tested on the chassis dynamometer. The term "road conditioned cars" simply means vehicles whose engines have the natural wear and deposits accumulated during thousands of miles of actual use, and, which, therefore, enable the scientists to conduct their advanced studies under realistic conditions.

Another advantage of the chassis dynamometer and cold room is that since the entire vehicle is used, all automotive petroleum products—from wheel-bearing greases to transmission lubricants—can be tested. After the chassis dynamometer tests have been conducted, if the situation warrants it, road tests will be run by test fleets to make certain that the new or modified products meet specifications of quality and performance.

In the final analysis, of course, quality and performance—not "drive-in refrigerators," or any other research tool—are the payoff, both to the motoring public and to the producers. Yet the tools are an indispensable means to those ends, and are deserving of notice in their own right. An artificially created winter in a room at Harmarville, Pennsylvania, on a sweltering summer day can directly result in a smooth, trouble-free start on a sub-zero night in the dead of winter at Houlton, Maine. It is not fantastic, for just such things do happen through refrigeration.

Operating Conditions

Equipment as furnished and now operating was guaranteed to produce refrigeration with ambient temperatures of 90° F, relative humidity of 75 per cent and barometer 29.24 inches mercury, as follows:

Chassis Dynamometer Room

1—Produce an average temperature of (-70° F) in 20 hours maximum pull down time with a 20,000-lb vehicle in the room and with additional loads of 2000-watts lighting, 2 operators, 200 cfm of make-up air, 52,000-lb of steel supports and miscellaneous, 7,200 lb of cooling coils and fan motor to circulate air.

2—Produce in 2 hours pull down an average temperature of 0° F with a 5,000-lb vehicle in the room and additionalloads of 2,000-watts lighting, 2 operators, 300 cfm of make-up air, 52,000-lb of steel supports and miscellaneous, 7,200-lb coils, etc.

3—Produce o° F average temperature during operation of a 200 hp engine. Internal loads will be 1,018-000 Btu/hr dissipated from engine, 2000-watts lighting, 850 cfm make-up air, air circulating fan and 2 men.

4—Supply 300 cfm of make-up for 16 hours and 850 cfm make-up air for 8 hours during tests run at temperatures below 32° F.

Provisions have been made for varying the humidity when operating at temperatures from 32° F to 80° F.

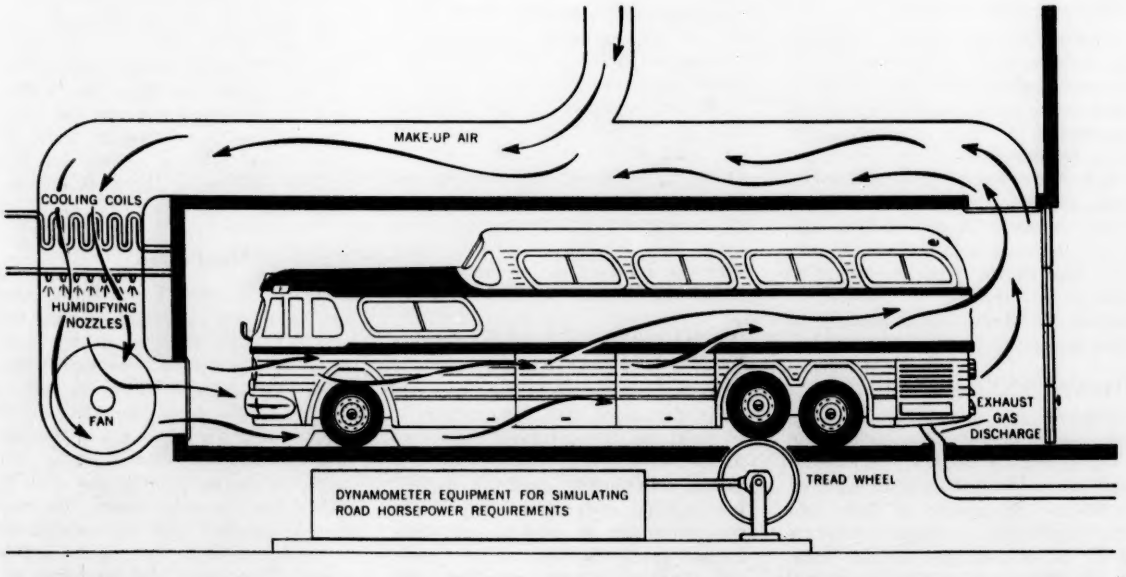


Fig. 4. Schematic drawing of a chassis dynamometer. Makeup air is cooled and dehydrated before it enters the air circulation system. Details of the three separate refrigerating systems employed in the environmental rooms, which controls carburetion air and for make-up air listed on page 13.

Refrigerating System: Major Items Of Equipment

Environmental Test Rooms:

2—75 hp Rotary Compressors (Boosters)
2—100 hp V/W Refrigerant Compressors (High Stage)
1—22-in OD x 12 ft Condenser
1—30 in OD x 10 ft Receiver
1—R-22 Non-Condensable Gas Separator
1—38 in OD x 10 ft Methylene Chloride Spray Cooler
1—Methylene Chloride Brine Tank 5 ft OD x 7 ft 6 in.

Pumps

1—300 gpm R-22 Liquid
1—430 gpm Methylene Chloride
1—375 gpm Methylene Chloride
1—205 gpm Methylene Chloride

Room Coils

Chasis Dynamometer Room
12—36" x 96" Fin type arranged 3 high, 2 wide, 2 deep
Engine Test Rooms, Each
6—30" x 96" Fin type arranged 3 high, 1 wide, 2 deep
Plant Refrigerant Charges
3,500 lb. Refrigerant 22
Plant Brine Charge
12,000 lb. Methylene Chloride

Make-up Air Drying System

1—15 hp VSA Condensing Unit
1—Direct Expansion Air Cooling Unit
1—Bryant B-1400 Rl—Air Dryer

Carbueration Dryer System

1—30 hp Condensing Unit
1—Direct Expansion R-12 Cooling Coil

Engine Cold Test Rooms

1—Produce an average temperature of (-70° F) in 16 hours with engine, bedplate and equipment weighing 4,000-lb, 1000-watts light, one man and air circulating fan. Engine not operating.

2—Produce an average temperature of 0° F in 2 hours. Load and conditions same as above.

3—Produce an average temperature of 0° F during operation of a 200 hp engine. Internal load of 636,250 Btu/hr dissipated by engine, 1000-watts lighting, one man, 850 cfm make-up air, etc.

4—Supply 300 cfm make-up air for 16 hours and 850 cfm for 8 hours during test runs at temperatures below 32° F.

Provisions have been made for humidifying air when operating above 32° F, same as for chassis dynamometer room.

Fig. 5. Viewed through an observation port in small environmental room, this operator makes adjustments to a Chevrolet engine on test. Room temperature was minus 70 F at the time.

New Railroad Refrigeration

▶▶▶ NORTHERN Pacific Railroad's 25 dual purpose refrigerator cars under construction with Pacific Car & Foundry Co. at Renton, Washington will be equipped with 10-ton Trane Co. refrigerating systems. Since the refrigerator cars will handle both frozen and fresh perishable food commodities, maintaining 90 to 95 percent humidity, the refrigeration systems are designed to hold temperatures from 0 to 70 F, and will additionally heat and cool as desired. A new reverse air flow principle will be employed to reduce load weight loss through dehydration. The system will also utilize a new evaporator design which is said to cut defrost time in half—to less than 30 minutes.

Philadelphia Plant For Chemetron Corp.

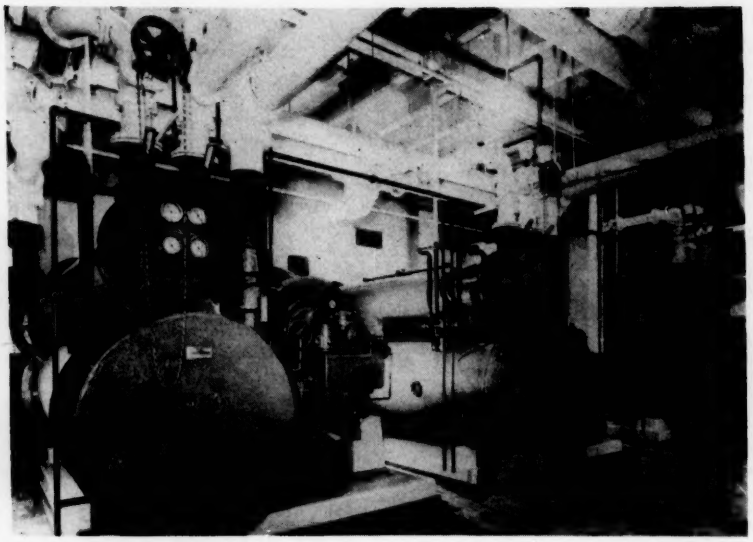
▶▶▶ CONSTRUCTION is under way on a $3 million dollar liquid oxygen, nitrogen and argon plant near Philadelphia for the National Cylinder Gas Division of Chemetron Corp. The new plant will provide a direct pipe line supply of oxygen to be used at a Conshohocken, Pa. steel plant. Oxygen is used in a new iron powder process. In addition to supplying high purity gases for the steel industry, the new plant will also fill needs of other Eastern industries.

Hydrofluoric Acid Plant For Pennsalt Chemical

▶▶▶ TO BE COMPLETED in July 1958 is another expansion of the hydrofluoric acid facilities at Pennsalt Chemical Corp., Calvert City, Ky. plant. Principal needs for the additional HF production are said to stem from the rapid growth in sales of the Chemical firm's new line of refrigerants and aero-sol propellants. Both anhydrous and aqueous hydrofluoric acid are also used in the production of materials used in connection with atomic reactors, high octane gasolines, glass, stainless steel and other industries. Industrial refrigeration is used in the production of this chemical and in the control of various processes where it is used.

Another Giant Refrigerator

▶▶▶ Mobil Dealer News, June 1958, reports their research department has also completed a drive-in refrigerator to test trans-continental buses.



Three Refrigerant-11 centrifugal compressor-condenser-chiller units provide 350 TR each to meet the cooling requirements in the General Petroleum building, Los Angeles. This plant plus the heating and ventilating systems to 1100-odd offices have been maintained in continuous use through a unique equipment service program.

Office Building Maintenance

Charted Weekly Assignments Spur Competition Among

▶▶▶ SUCCESSFUL describes the preventive maintenance and equipment servicing program in the largest office building in downtown Los Angeles. For nine years air conditioning has been furnished without an interruption and there has been negligible overtime expenditures for maintenance. Such is the planned service program described to California Chapter No. 2, NAPRE, by Bernard Stayton, chief engineer, General Petroleum Building, Los Angeles, California.

In a talk on Maintaining Refrigeration and Air Conditioning in a Large Office Building, Chief Stayton confined his comment to the half-square block, 13-story building at 6th and Flower Streets. He told how the nearly 500,000 sq. ft. of building floor area is air conditioned with a total of 3100 hp finger-tip controlled refrigerating and heating plant. Before giving the technical details of the refrigerating system, ventilating circuits, condensing cycle, and other mechanical equipment which serves the G. P. building, Stayton described the program of preventive maintenance that has kept the system in continuous operation for nearly a decade.

Key to satisfactorily servicing of a daily refrigeration and air-conditioning operation in a large office building, according to Stayton, is an adequate maintenance program. Such a program, he said, must cover not only the refrigeration, heating and ventilating, but all other related equipment associated with the air conditioning plant. To prevent breakdowns which might occur at an inconvenient time, the engineering staff of the General Petroleum Building prefers to dismantle and inspect the equipment themselves, periodically, rather than let the equipment break down of its own accord for lack of internal inspection.

In setting up their program, Stayton advised, each piece of equipment was analyzed to determine how much maintenance was necessary, and how frequently service should be accomplished. Because of limited manpower available to him, he installed a simple visual check system whereby a finger could be kept on the progress of service within the plant.

Weekly Assignments Posted On Four Annual Charts

Heart of the inspection and maintenance program at the GP building, Stayton revealed, is a large bulletin board with four charts which is set up in the chief engineer's office. A maintenance man is assigned to each chart. The charts contain a listing of all the equipment in the building that needs maintenance on a periodic basis. The periods are literally pinned down to a week each.

Each chart contains a key for the type of maintenance to be performed. The interval is set, and the maintenance record progresses across the chart from January through December. This is done by moving colored map pins. The pins denote when the maintenance shall be performed.

When the pins are moved to the next period, a colored pencil mark fills in the square from which the pin was removed, leaving a record on the chart of when inspection or maintenance was done, with the pin showing when it shall be done again. "Each man is responsible for his own chart and equipment", Stayton said. "The charts are always on display for everyone to look at, this being readily exposed to inspection and criticism. We find that by having the charts displayed at all times, there are few items ever neglected".

Stayton explained that a modern visual card file was first considered but this idea was discarded. With cards, an operator must first think of the job before looking to see what

By FRED HERR
Los Angeles Correspondent

Vertical aluminum fins in the architectural treatment of this Southern California building are credited with reducing solar-glass heat loads to the extent of saving 100 TR capacity. In addition to these reflective measures the architects employed certain insulating features in the building construction itself to reduce heat gains.

Program

Engineering People

details must be done; whereas, by the use of the chart system, the job is always in plain sight, and can be scrutinized each day, both by maintenance men and the supervisory engineers.

After the maintenance plan was agreed upon and set up, Stayton related, a listing or historical record of all equipment was made. The listing consisted of all pertinent information regarding the individual apparatus, as to manufacture and component parts, so that any part could be ordered or replaced without delay. A normal amount of spare parts is always kept in stock, the amount and type of parts being based on experience as to what is most likely to break down on certain designs or makes of equipment.

While overhaul, part replacement and such are noted on the machinery lists or history, the month-by-month service on every conceivable part of the machinery is recorded on the charts. One chart, Fig. 1, lists such items of maintenance as compressor oil filters on all three of the Worthington compressors; compressor motor oil, gear box oil, ram lubricator; leak test, automatic purge unit; condenser inspection; condenser pumps and motors, chilled water pumps and motors; compressor gear couplings; etc.

The chart for recording filter changes in fan rooms (Fig. 2) contains a month-to-month record of filter changes in 48 fan rooms located from the second to the 13th floors, basement fan rooms, and first floor lobby. Precision inspection information is also recorded on the miscellaneous equipment and boiler room charts, charts three and four.

Details Building Systems

Next described by Stayton was the air conditioning and heating system itself. The building, he said, is equipped to turn out a ton of ice every day for every office in the 13 story, rectangular shaped building.

The air cooling and heating system, which involves 48 separate fan rooms with 54 fans to provide zone control, is powered by 1600 hp of electrical motor equipment. Another 600 hp of capacity is available in four oil or natural gas-fired boilers, and 900 hp capacity in three centrifugal compressors, which brings the total horsepower input to 3100.

Compressors in the building air conditioning system consist of three centrifugal machines using Refrigerant-11, each capable of producing 350 TR. Four chilled water pumps each serving one of the group of fan rooms on each floor, supply refrigerated water throughout the building. Cooling tower is located on the roof of the building, and is completely surrounded by a sheet metal superstructure for architectural reasons. It is described as an eight cell induced draft tower, 97x13x25 ft. high.

The General Petroleum Building, Stayton explained, is equipped with a twin duct system, one duct carrying cooled air and the other heated air, with the ducts joining as they enter each outlet. Air outlets are spaced to fit the modular design of the building which is on a 14- and 7-foot plan. Each outlet has its own thermostatic control (the building has 1100 indi-

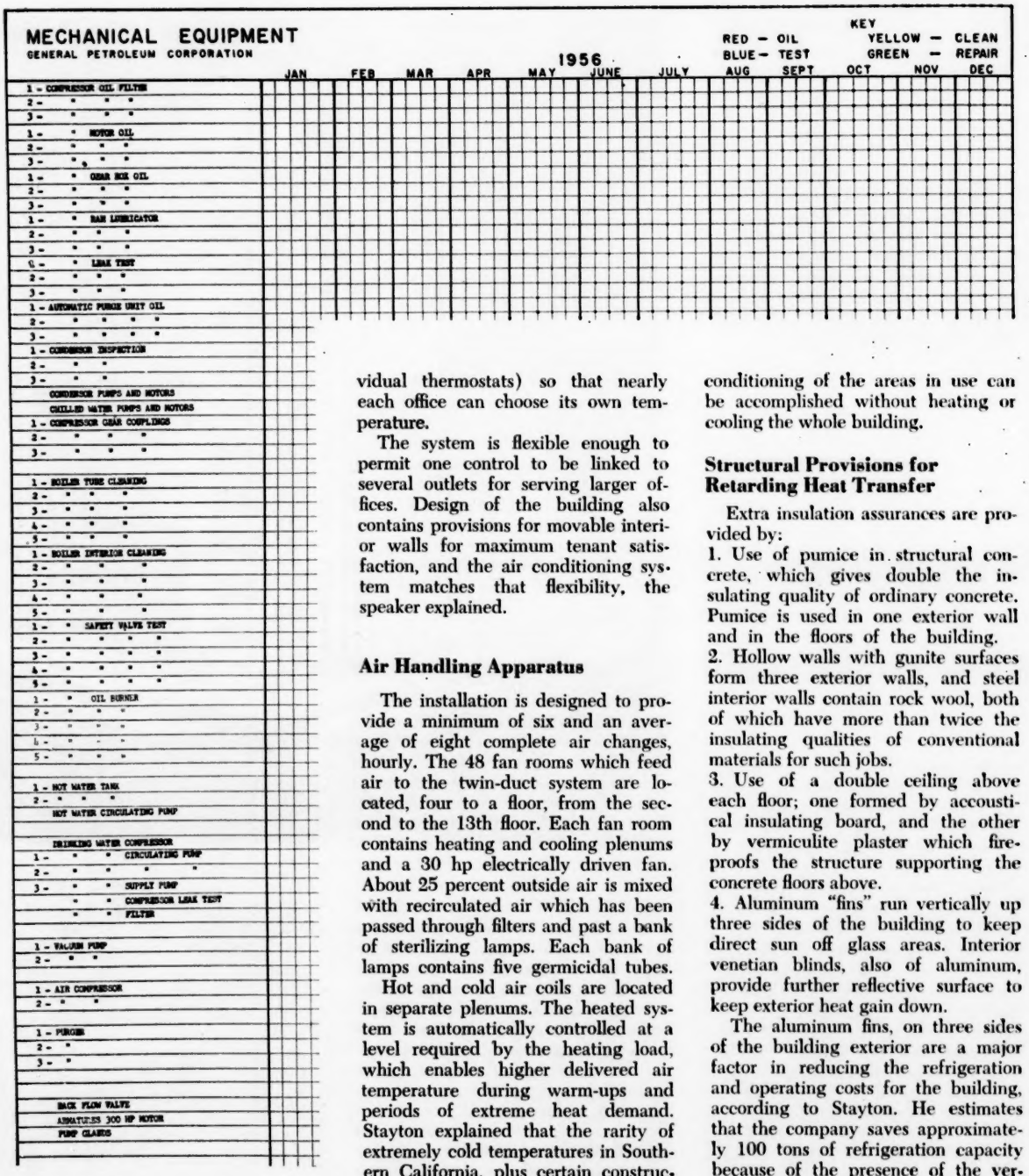

MECHANICAL EQUIPMENT
GENERAL PETROLEUM CORPORATION
1956
KEY
RED — OIL
BLUE — TEST
YELLOW — CLEAN
GREEN — REPAIR
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1 - COMPRESSOR OIL FILTER
2 - " " "
3 - " " "
1 - " MOTOR OIL
2 - " " "
3 - " " "
1 - " GEAR BOX OIL
2 - " " "
3 - " " "
1 - " BAR LUBRICATOR
2 - " " "
3 - " " "
1 - " LEAK TEST
2 - " " "
3 - " " "
1 - AUTOMATIC PURGE UNIT OIL
2 - " " " "
3 - " " " "
1 - CONDENSER INSPECTION
2 - " "
3 - " "
CONDENSER PUMPS AND MOTORS
CHILLED WATER PUMPS AND MOTORS
1 - COMPRESSOR GEAR COUPLINGS
2 - " " "
3 - " " "
1 - BOILER TUBE CLEANING
2 - " " "
3 - " " "
4 - " " "
5 - " " "
1 - BOILER INTERIOR CLEANING
2 - " " "
3 - " " "
4 - " " "
5 - " " "
1 - " SAFETY VALVE TEST
2 - " " " "
3 - " " " "
4 - " " " "
5 - " " " "
1 - " OIL BURNER
2 - " " "
3 - " " "
4 - " " "
5 - " " "
1 - HOT WATER TANK
2 - " " "
HOT WATER CIRCULATING PUMP
DRINKING WATER COMPRESSOR
1 - " " CIRCULATING PUMP
2 - " " " "
3 - " " SUPPLY PUMP
" " COMPRESSOR LEAK TEST
" " FILTER
1 - VACUUM PUMP
2 - " "
1 - AIR COMPRESSOR
2 - " "
1 - PURGE
2 - "
3 - "
BACK FLOW VALVE
ARMATURES 300 HP MOTOR
PUMP GLANDS

Fig. 1. Lubrication very likely plays the most important role in the proper maintenance in the air conditioning system which is kept in continuous operation. Chart above is one of four posted in the engineer's office of the General Petroleum Building.

vidual thermostats) so that nearly each office can choose its own temperature.

The system is flexible enough to permit one control to be linked to several outlets for serving larger offices. Design of the building also contains provisions for movable interior walls for maximum tenant satisfaction, and the air conditioning system matches that flexibility, the speaker explained.

Air Handling Apparatus

The installation is designed to provide a minimum of six and an average of eight complete air changes, hourly. The 48 fan rooms which feed air to the twin-duct system are located, four to a floor, from the second to the 13th floor. Each fan room contains heating and cooling plenums and a 30 hp electrically driven fan. About 25 percent outside air is mixed with recirculated air which has been passed through filters and past a bank of sterilizing lamps. Each bank of lamps contains five germicidal tubes.

Hot and cold air coils are located in separate plenums. The heated system is automatically controlled at a level required by the heating load, which enables higher delivered air temperature during warm-ups and periods of extreme heat demand. Stayton explained that the rarity of extremely cold temperatures in Southern California, plus certain construction features of the building, make it possible to heat the entire building by hot air ducts.

All fan rooms are controlled from a single panel located in the basement engine room. Indicator lights show which of the 48 fan rooms are in operation. A fan room is designed to serve a number of areas in the building, but can also be operated independently of all other fan rooms. Thus, when small sections of the building are in use at night, or on week ends or holidays, effective air conditioning of the areas in use can be accomplished without heating or cooling the whole building.

Structural Provisions for Retarding Heat Transfer

Extra insulation assurances are provided by:

1. Use of pumice in structural concrete, which gives double the insulating quality of ordinary concrete. Pumice is used in one exterior wall and in the floors of the building.
2. Hollow walls with gunite surfaces form three exterior walls, and steel interior walls contain rock wool, both of which have more than twice the insulating qualities of conventional materials for such jobs.
3. Use of a double ceiling above each floor; one formed by accoustical insulating board, and the other by vermiculite plaster which fireproofs the structure supporting the concrete floors above.
4. Aluminum "fins" run vertically up three sides of the building to keep direct sun off glass areas. Interior venetian blinds, also of aluminum, provide further reflective surface to keep exterior heat gain down.

The aluminum fins, on three sides of the building exterior are a major factor in reducing the refrigeration and operating costs for the building, according to Stayton. He estimates that the company saves approximately 100 tons of refrigeration capacity because of the presence of the vertical fins.

The fan rooms are comparatively small (225 sq. ft.), which was done to keep usable office space at a maximum. While the fan rooms are compact, complete accessibility to all equipment is possible. The duct system also was designed with an eye on saving space. Stayton described the ducts as being only 5 inches in depth, yet providing ample capacity for the building's needs. The chilled water risers which connect the fan rooms with the basement plant are

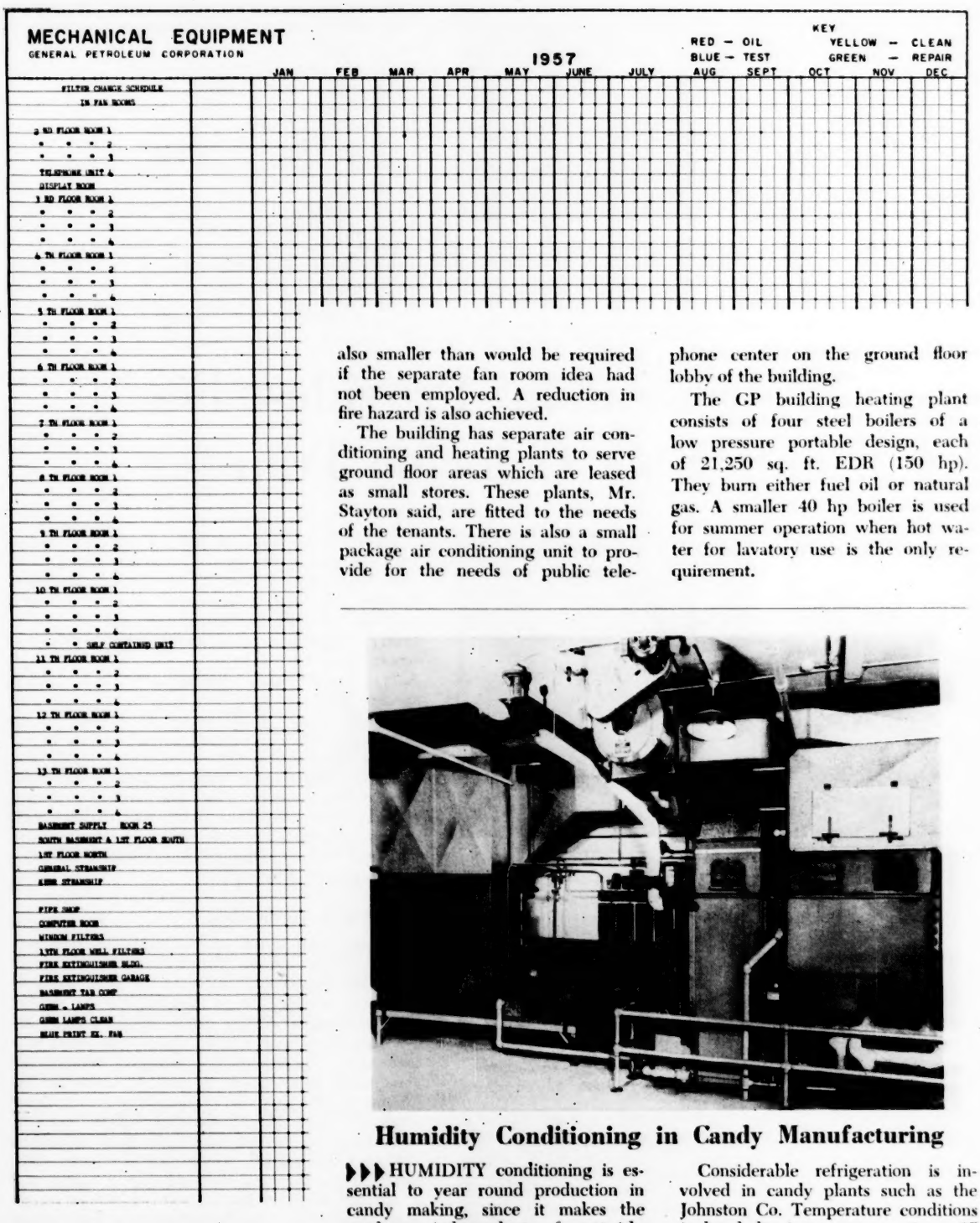


Fig. 2. Important to the economic operation of the building both from the standpoint of operating load and office renovating, is the changing of filters in the air conditioning system.

also smaller than would be required if the separate fan room idea had not been employed. A reduction in fire hazard is also achieved.

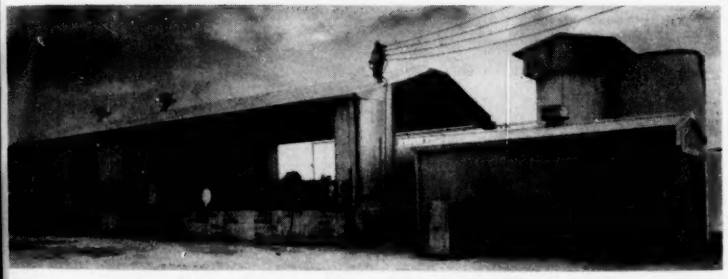
The building has separate air conditioning and heating plants to serve ground floor areas which are leased as small stores. These plants, Mr. Stayton said, are fitted to the needs of the tenants. There is also a small package air conditioning unit to provide for the needs of public telephone center on the ground floor lobby of the building.

The GP building heating plant consists of four steel boilers of a low pressure portable design, each of 21,250 sq. ft. EDR (150 hp). They burn either fuel oil or natural gas. A smaller 40 hp boiler is used for summer operation when hot water for lavatory use is the only requirement.

Humidity Conditioning in Candy Manufacturing

▶▶▶ HUMIDITY conditioning is essential to year round production in candy making, since it makes the producer independent of outside weather conditions at all times. The Robert A. Johnston Co. candy manufacturing plant employs an air conditioning system in which is incorporated dehumidifying apparatus. The system of dehumidification in this plant is a Surface Combustion Corp. application.

Considerable refrigeration is involved in candy plants such as the Johnston Co. Temperature conditions in hand dipping rooms require a 65 F dry bulb. There is considerable heat present from the manufacturing process, most of which comes from the chocolate which has considerable latent heat. For setting of chocolate, a 40 to 45 F dry bulb is desirable and under the extreme conditions it should not exceed 50 to 55 percent.

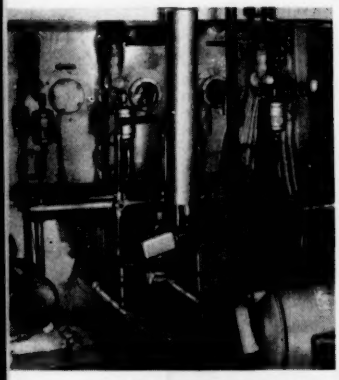


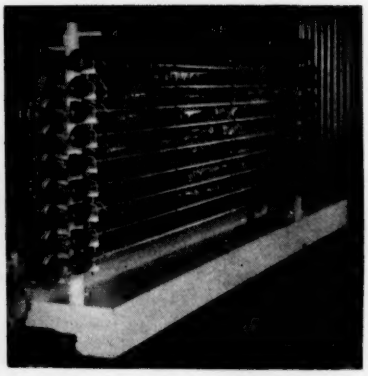
Tenth Jones Chemical Corp. plant, St. Petersburg, Fla., for bulk chlorine transfer and redistribution, utilizes a latent heat refrigeration application for processing. Air condenser located on ground right foreground, serves compression system.

▶▶▶SOME industrial applications of refrigeration may be in small tonnages at times, but nevertheless the application can be critical or very important. Tenth chlorine distribution plant for Jones Chemical Corp., recently placed in operation at St. Petersburg, Florida, could be considered typical of the small but important installation.

Chlorine, a versatile and widely used industrial chemical is most practically handled in liquid form (gaseous, it takes 462 times its liquid volume). Refrigeration is used in chlorine production for liquefaction. At distribution points refrigeration is again applied, to assure that the chlorine remains in a liquid state during transfer phases. It is also desirable to regulate its temperature for blending since it has a maximum solubility at approximately 50 F.

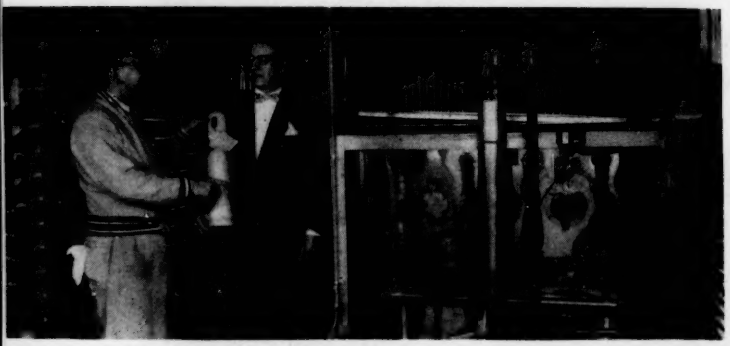
Refrigeration Provides For Safe Bulk Chlorine Transfer





Above, left, is a close-up of the King Zeero Ice bank showing liquid supply, driers and expansion valves, and the suction manifold. Water recirculator is pictured at lower left. Second illustration, at right, is a close-up of the pyrex glass heat exchanger over which the chilled water flows, maintaining a constant temperature to the liquefied chlorine in process.

Below, plant manager A. J. Leibfarth makes a moot point with President John W. Jones, Sr., Jones Chemical Corp., who holds one of the smallest chlorine containers supplied to industrial, water works and sewage disposal projects near St. Petersburg.



Latest in the chain of Jones Chemical Co. distribution plants (strung out from Caledonia, New York to Florida) is the St. Petersburg installation. Primary function of the new plant is to refill chlorine cylinders from tank cars and in turn to supply them to local industry, water works and sewage disposal plants.

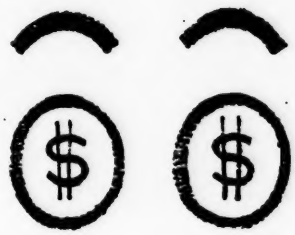
Transfer of liquid chlorine from tank cars to smaller containers and storage involves a peak refrigeration demand. Demurrage on a tank car for "at will" cylinder recharging operations can be expensive. Therefore the latent heat application of a secondary refrigerant is made-to-order for the chlorine distribution center. Jones Chemical Co. selected a King Zeero ice bank with which they build sufficient refrigeration potential or reserve to carry their operations through the peak demands occurring with tank car deliveries.

Latent Heat Application

A small halocarbon air-condensing refrigeration system builds ice on the coils within the unit. When the chemical is delivered via bulk transportation, it is made ready for transfer to smaller re-distribution vessels by circulating ice water from the King Zeero unit over a cascade-type pyrex heat exchanger. Bleach liquor circulating through the glass tubes is cooled as a result. Use of the refrigerated water has the added advantage of closer control for more efficient handling of the product, as well as prevention of shock to the heat exchanger.

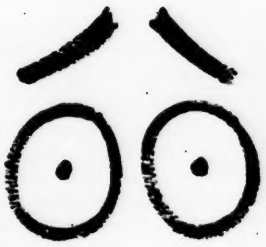
Jones Chemical Co. is reported as serving more municipalities than any other chlorine repackers, and is credited with foreign accounts in 23 countries. Their installaton at St. Petersburg is a duplicate of the two-year old King Zeero installation at Charlotte, N.C.

According to A. J. Leibfarth, plant manager, who was interviewed at the St. Petersburg plant, the latent heat application saved capital investment in orignal equipment, and continues to save time and money for the firm. He reported the Charlotte installation as being trouble-free.



March—Began buying lower grade ammonia at bargain price . . .

Later—Non-condensable gases formed, head pressure up . . .



Still later—Too much moisture, float valves frozen . . .

Too late—Cooling room temperature up, lost day's production . . .

Be trouble-free—use only Armour 99.98% pure ammonia in your refrigeration system!

Such consistent purity, plus a dependable delivery service from 163 stock points and 8 bulk stations, makes Armour your one best source for trouble-free ammonia every time. For further information, sulfur tapers and test papers, write us on your company letterhead.

ARMOUR AMMONIA DIVISION

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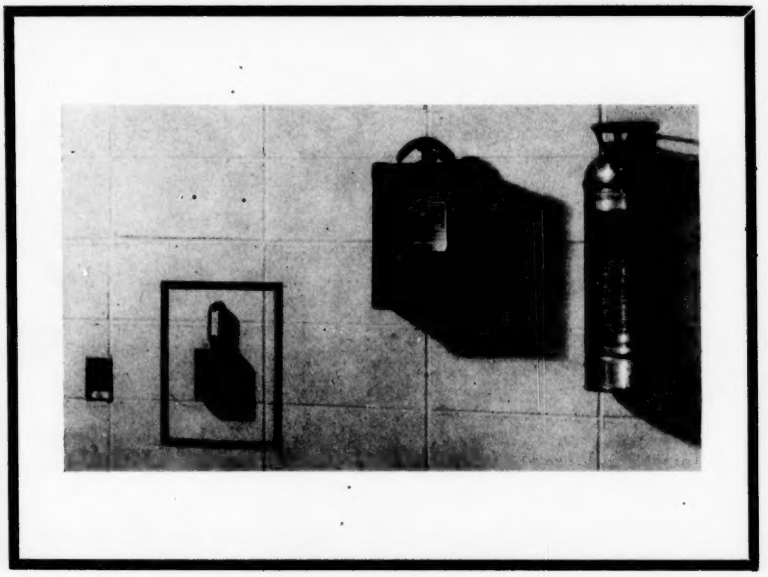
Surviving and Preventing Disasters



Will Your Plant Personnel Come Thru An Explosion?

▶▶▶ EXPLOSIONS and such serious derangements in operating enterprises are not pleasant subjects to contemplate, but they do continue to happen. When they do occur, results are even more distasteful to view, restore, rehabilitate and compensate.

Headlines above may appear to place the effect before the cause. However, in just such recent, almost monthly, events that is precisely what appears to take place. Disaster occurs before causes are determined, of course, but in many cases preventive steps (which would have remedied the causes) were in order before the derangement or near-calamity came about.

Moreover, operating personnel and their management are not alone to blame. It appears that design and manufacturing, consulting and contracting, underwriting and regulatory activities can share a certain amount of oversight in two cases recently reported.

Many bodies like the B9 Committee[1] are already taking steps to encourage manufacturing of safer design and their proper application in the field, plus urging that standards promulgated are adopted and enforced. Some associations such as the NARW, through their safety committees, are urging member operating firms to formulate disaster procedures and drill personnel in them. Still other practical groups like NAPRE are presenting educational programs for the instruction of engineers in proper operation and maintenance of equipment.

In view of the Spring rash of derangements all such groups may wish to re-examine their programs and improve on them where they may. Especially so where there appear in the following reports some very pertinent facts, not only helpful to bettering emergency plant procedures and the expansion of preventive maintenance practices, but suggestive of improved machinery design and piping practice.

Refrigerant Explosion Report

An emergency signal at 8:30 am. indicated a break in refrigerant lines in the main refrigerating spaces. "At that time, I was in another part of the building, and when I returned to the compressor room, everybody had evacuated." So reads the report of the chief engineer of a large West Coast brewery.

"After securing the natural gas cutoff to the boilers in the adjoining room, I found it was impossible to enter the compressor room with the conventional canister type gas mask. There were eight of these available in accessible places. In the meantime, the fire department arrived. I put on one of their air pack masks and proceeded to the compressor room where I found a break in a 2½-in discharge line of No. 1 compressor. (The line had sheared off in the threaded connection to this 9 x 9-in ammonia machine).

"After securing the suction valve on the machine, I proceeded to pull the circuit breakers on No. 1's motor and the four other machines in operation. The fourth compressor motor breaker drew an arc and ignited the mixture of ammonia, air and a slight presence of oil vapor at the power panel. A terrifying noisy explosion followed which lifted the 75 ft. long sky light and knocked me to the floor.

"I had given up all hope of survival" the chief related, "but after making my peace with this world, I came back to earth. I saw long beautiful bluish flames the entire length of the compressor room about two feet above my head. There were several layers of gases igniting, one at a time. After realizing that I was still among the living, I crawled on my hands and knees to the outside of the building, opening a fire door which had closed by the flames melting the fusible link.

"After I instructed one of the engineers to secure the discharge valve between the header and No. 1 compressor, the plant was ready to operate again," the report continued. "I was taken by ambulance to the hospital where I remained four weeks recovering from severe shock and second and third degree burns on my hands and head.

[1]ASA Committee on Safety Code for Mechanical Refrigeration, B9.

← Access Vestibules Can Be Safety Stations

▶▶ THREE entrances to the machinery room of a modern mid-west dairy firm are equipped with UL fire alarm pulls, gas masks and extinguishers. An added safety feature is provided on the fire pull in that it is wired to stop all motive machinery in the engine room and to start remote ventilating fans. Electrical drive controls are located in a room separately ventilated and not accessible from the machinery space. All control equipment, float switches, etc. are equipped with UL approved switches, eliminating to the greatest possible extent any opportunity for spark which is described in one of the explosion case histories which are given below.

Emergency Switches Outside Machinery Room

▶▶ TRRF, at the Scientific Advisory Council meeting in Dallas last March, gave special attention to conditions under which ammonia can explode. Edward Simons, SAC member, called attention to the advantage of placing switches outside the machinery room for disconnection in emergencies. American Standards Assn. Safety Code for Mechanical Refrigeration, paragraph 2.35, F, reads as follows: Emergency remote controls to stop the action of the compressor shall be provided and located immediately outside the machinery room; Also H, as follows: Emergency remote controls for the mechanical means of ventilation shall be provided and located outside the machinery room.

Fork Lift Carries Away Liquid Ammonia Supply

▶▶ READING the reprint of K. M. Holaday's "How Dangerous is Ammonia" in the May issue of *Industrial Refrigeration* prompted a reader to write the following: "A couple of months ago a fork lift operator hit a 1-1/4-inch liquid line and broke it off smooth. Since our plant employs a recirculating system, liquid ammonia poured out into the room like water until the pump was secured. By means of our standard emergency procedures the situation was placed under control, repairs effected and the room returned to operation without casualty. Strange as it may seem, and this holds true to all my experience, there wasn't an ounce of frozen product lost."

Are They Cognizant of Serious Derangements in the Making?

Lessons To Be Learned

"What can we refrigerating engineers learn from this accident?" the chief writes. "A 2½-in. line discharging at 150 psig for 20 minutes will create a concentration of NH_3 to at least 50 percent. If we keep in mind that ammonia is lighter than air, **one can generally survive by laying on the floor with the proper safety ammonia mask.**

"There were six DC exciters about 8-in. off the floor running at all times. The commutators generally spark, but apparently could not ignite the mixture. However, **one arc from a circuit breaker located 6 feet from the floor did start the fireworks.**

"**I would enter any gas filled room with an air pack or oxygen mask and survive!** The conventional canister type mask is only good for a 2% to 3% concentration of ammonia.

"Today we have laws and local ordinances which bring about welded ammonia piping. But in most cases, the suction and discharge connections on the compressors are threaded! **Welded flanged connections should be on all compressors.** The weakest link in our accident was the threaded nipple on the compressor.

"The break might have been caused by a slug of liquid ammonia or by settling of the foundation (caused by the heavy rains this Winter, as our soil conditions are poor and on account of our central location in town, our plant has more equipment per sq. ft. than any other brewery in the country). There are many more possible causes, like layout of piping, etc., but one thing must be remembered – hardly two plants are alike and any single accident can hardly be judged without knowing the background and circumstances connected with it".

However, all can benefit from a report and subsequent correspondence of this nature. Reviewing:

1.) Are the compressors in your plant fitted with threaded connections?

2.) Is electrical apparatus located outside the machinery space in a separate vault or space secure from gas fumes? Are electric control devices on equipment in accord with UL examination service?

3.) Are safety masks in accessible places, of adequate protection, and in tip-top condition?

4.) Would your personnel be competent in the use of breathing apparatus and have the confidence in their own ability to render such an emergency performance, and survive?

5.) Are your engineers as cognizant of potential danger in an unexplained circumstance, as these mechanics were in the following case?

Fuel Gas Hazards Often Overlooked

As emphasized in "Blast Rocks Richmond", March 1958, INDUSTRIAL REFRIGERATION, the danger of explosion and asphyxiation is present with all types of compressed gases, whether high or low pressure and whether used for refrigeration or fuel. In the large majority of cases both fuel and refrigerant gases are used in refrigerating enterprises. Therefore, it cannot be over-emphasized that personnel should be just as adequately and thoroughly trained in fuel gas system operations. And, smart plant management doesn't overlook proper handling of welding gases, either.

An example of a fuel gas leak which could have led to disastrous consequences occurred in Texas not too many months ago. It was strictly by accident that a welder noticed a peculiar phenomena and reported it to the engineer in charge. The supervising chief engineer investigated and realizing the consequences, alerted the local fire department and the gas company. The area was evacuated and within the time of one shift, the danger potential was reduced, the leak located and isolated.

Meat Plant Locale

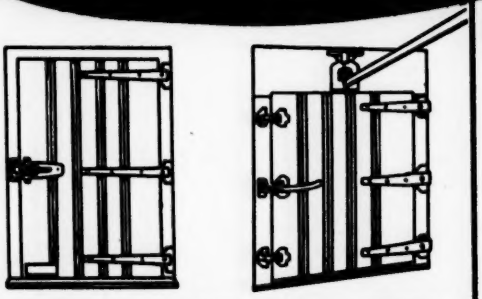
In construction of an addition to a packing house, specifications had called for the burning off of steel members protruding from a wall of the existing structure in order that they would not penetrate the insulation of the new cooler to be erected adjacent. The welding mechanic who was handling the torch noticed flames emiting from cracks in the mortar

(Continued on Page 24)

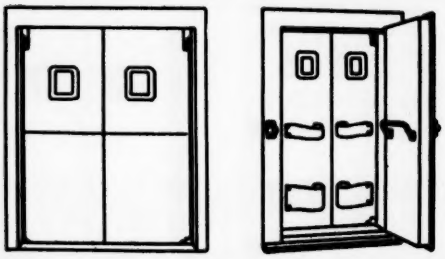
"Butcher Boy"

Since 1885

EXCLUSIVELY ENGINEERED

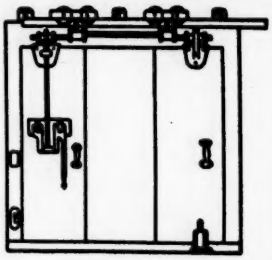


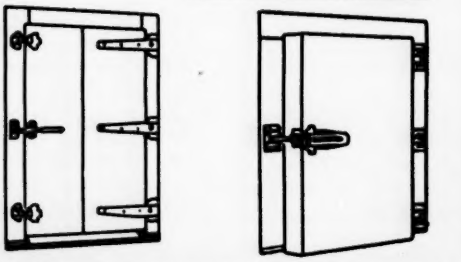
STANDARD COOLER-FREEZER DOORS



STANDARD VESTIBULE AND AUTO-CLOSE DOORS

HORIZONTAL SLIDING DOORS (Manual)





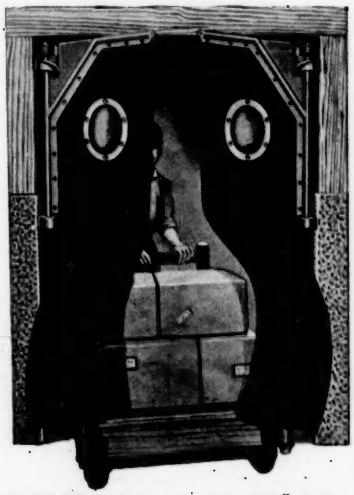
LOW TEMPERATURE INFITTING and OVERLAP

AUTOMATIC ELECTRIC DEFROSTERS
WITH THERMOSTAT CONTROL

CATALOGS AVAILABLE UPON REQUEST

FLEXIBLE RUBBER BATTEN DOORS

INCLUDING STANDARD DOOR FRAME at no extra cost!



TYPE "TSH" WITH SEMI-HEIGHT MOUNTINGS

Especially adaptable for smaller door openings.

THEY PERMIT

1. Safe passage of hand or power operated equipment with wider pallet loads.
2. Corner cutting with hand and power trucks.
3. Repeated abuse from impact of trucks at minimum damage and maintenance costs.

Model TSH battens are made of ¼" thick Neoprene (no grain) or of ¼" tough specially compounded rubber, reinforced with 2 layers of heavy cotton duck. Materials remain flexible even at extremely low temperatures.

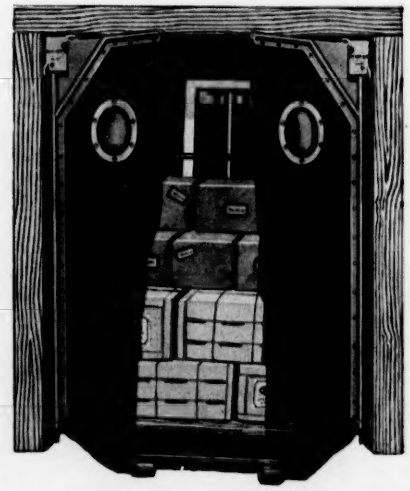
Model TSH battens are furnished with No. 12 gauge galvanized steel jamb guards applied 4' 0" high with *no protrusions into the clear door opening.*

TYPE "FH" WITH FULL HEIGHT MOUNTINGS

Designed for wider and "straight traffic" doorways.

ADVANTAGES

1. Loss of refrigeration is held to a minimum.
2. Extra rigidity — tighter doorways.
3. Eliminates exposure and drafts near loading docks or at other openings.
4. Flexibility of battens permits repeated abuse and shock of mobile equipment contacts.
5. Permits movement of trucks and pallets at high speed in and out of refrigerated or other storage areas.



Model FH battens are made of ¼" thick Neoprene (no grain) or of ¼" tough specially compounded rubber, reinforced with 2 layers of heavy cotton duck. Materials remain flexible even at extremely low temperatures, and will not tear under most severe conditions.

BUTCHER BOY REFRIGERATO

1000 BUTCHER BOY DRIVE

REFRIGERATOR DOORS

Electro SAFETY-SLIDE HORIZONTAL DOORS

FEATURING **STRUCTURAL SIMPLICITY**

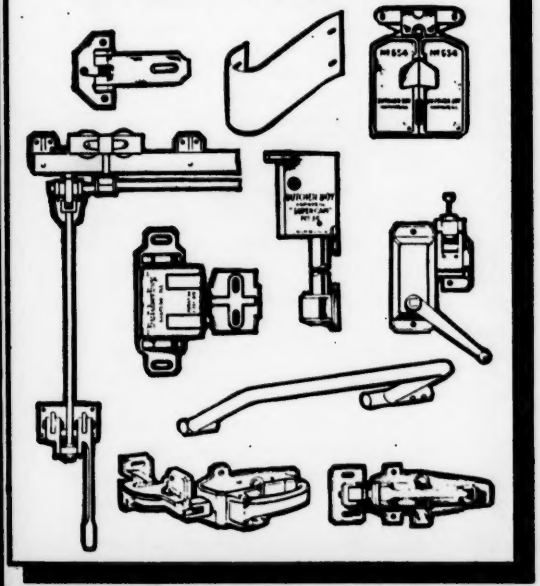
- **MECHANICALLY SOUND**
- **COMBINED "SPEED AND SAFETY"**
- **EXCLUSIVE AUTOMATIC SEALING "Gasket Assembly"**
- **SIMPLIFIED INSTALLATION**

Bi-Parting Horizontal Sliding Doors Available. CAUTION: Not recommended for use in cooler or freezer areas. Bi-Parting double horizontal sliding doors, of necessity, require gasket seals where the doors meet at the center of the opening. Hence, gaskets must be applied at "vulnerable" areas, exposed to contact by trucks or other objects which will rip or tear the gaskets, thereby destroying the necessary seal between the doors. *Field experience dictates this precaution against the use of bi-parting sliding doors.*

14 OUTSTANDING FEATURES

1 Overhead chain drive.
2 COMPACT—Electric Power Operator Assembly.
3 Heavy malleable iron Hanger Brackets.
4 Hyatt roller bearing Door Bracket.
5 Manual "Safety Release".
6 Automatic Sealing Assembly.
7 Automatic Electric Defrosters.
8 Concealed electric systems.
9 Safety Edge.
10 Complete Frame metal clad.
11 Special "SEAL" and "SILL" gaskets.
12 Defroster Drain Outlet.
13 Manual "Interior Safety Release".
14 "Roller-Type" Floor Wedges.

DURABLE HARDWARE

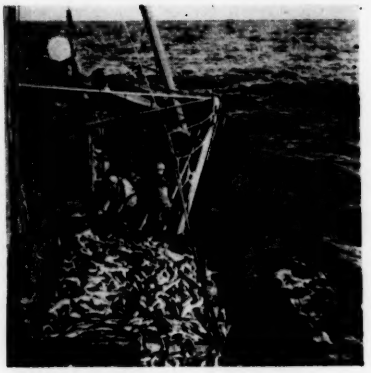


DOOR CO., Dept. "IR"
HARVARD, ILLINOIS

Eleven Decades for Chicago Fish Firm

R. P. Fletcher, Jr., President, Booth Fisheries Corp.

Booth Fisheries Home in 1857, Dearborn & Madison Streets, Chicago.



One of Booth's trawelers pulling in haddock in the North Atlantic.

▶▶▶ COMPLETING the first decade on a second century in a specialized food field, Booth Fisheries Corp. is observing its 110th Anniversary without parallel in the fishing and seafood industry. Started in the Spring of 1848 by Alfred Booth, Booth's capacity in plant equipment, vessels and freezer space is a typical American success story.

Headquarters of the largest seafood company are in Chicago. Booth had picked Chicago and the fish business as offering the most prosperous commercial prospects when he came to the United States from Glastonbury, England. His modest beginning was with the fish cart, buying fish from lakefront fishermen and selling them to Chicago's housewives.

The famous Chicago Fire of 1871 destroyed the three stores he had established by that time. He re-established and by 1900 had branched out to become the largest concern of this type in the United States. Depression days of the 30's dealt the firm a severe blow but it was reorganized in 1933 under R. P. Fletcher, Jr., who was made president of the corporation. Fletcher is still president.

Pioneer Processor

Booth was among the pioneers marketing fresh frozen fillets. Modern quick freezing and improved packaging of seafood, and many other items pioneered by Booth, had transformed the old type fish market into a specialty frozen food processing and distributing business. Nearly $6 million dollars has been invested by Booth in the last ten years on plant equipment and expansion improvement to keep pace with the acceptance of this type of semi-prepared foods by the general public. In the same length of time, revenues for Booth have increased from nearly $27 million to almost $47 million.

Booth is said to have been the first to market the popular fish sticks, having put them on the market as early as 1939. In subsequent years the company widened the variety of conveniently packaged fish and seafoods. As indicated, Booth sales of these products now amounts to more than 60 percent of the total revenue.

Surviving Disasters— (Continued from Page 21)

around the cement block and tile wall whenever he brought his torch close to the wall to do his burning operation.

Securing his flame and moving his equipment (including acetylene and oxygen flasks) away from the wall, he hastened to the engineer and reported his finding. The chief investigated and confirmed the phenomena. In the open air no one could detect an odor and although he suspected fuel gas, the chief knew that there was not a gas line in that area of the building. However, he realized that the gas was apparently transient and was following through the hollow areas of the wall.

He caused the company's meat packing operations and activities in that area to be suspended and sent all but qualifying personnel home—out of the area. The fire department arrived and roped off a 3-block area. The gas company arrived with their sensitive instruments and detectors but was unable to pinpoint the source of the gas which was determined to be natural gas.

Very gingerly, the plant forces removed a number of blocks, keeping in mind that construction equipment which would spark or produce heat would probably set off a resounding blast. Sufficient building material was removed that large portable ducts from a mobile low pressure fan set could be connected and the wall ventilated.

Mixture Too Rich

Gas company officials and the fire marshall had concluded that an explosion did not take place when the welder applied his torch due to the fact that the mixture was too rich. As long as the mixture within the walls remained at too high a proportion of gas to air, there is no danger from explosion. However, by use of instruments and tables the gas company was able to determine just when the critical point had been reached during the ventilating process. All personnel of the plant, fire department and gas company were then evacuated. It was a number of hours until they could safely return.

Needless-to-say, the wall remained ventilated for a number of weeks and was closed up as one of the last items of the new construction work. In the meantime it was discovered that the leak was in a 2-in. branch line placed underground some years earlier by a previous owner for supplying gas to temporary offices erected at another part of the property. The line had never been dug up, nor had it been properly isolated or disconnected at the point origin.

Disaster procedures which are now being re-established by those segments of the industry which have overlooked them somewhat in recent years, will indoctrinate and educate personnel in safety habits and emergency routine.

NAPRE QUESTION BOX

H. P. Hayes

HAVE A QUESTION? Address it to Prof. Harold P. Hayes, Dean of Engineering, State Polytechnic College, San Luis Obispo, Calif. Answers appear monthly in this department on problems forwarded by NAPRE members. Comments from all readers welcomed.

Slug Backs

QUESTION: What causes slug backs in an ammonia plant equipped with recirculating systems? Specifically this occurs when a sudden heat load is put in the cooler or freezer. Apparently more than enough ammonia is circulated to cause the liquid receiver to carry over, or to recycle the system, or in some cases to kick out the entire system when it is needed most.—F.D., Denver.

ANSWER: The malfunction described frequently occurs at "start-up" of a new plant. It generally comes about from a float level setting that is too high. Setting the level of the low pressure receiver takes quite some time and is done experimentally. The most desirable setting is one that will have the lowest level in the receiver in keeping with a positive head on the pump at all times.

—J.H.H., San Luis Obispo, Calif.

ANSWER NO. 2: The carry over of liquid ammonia from recirculated coils in large amounts sufficient to shut down an automatic high side, is caused by liquid trapping in the coils or in the suction line. When coils are bottom bed, and/or when suction lines rise between the evaporator outlet and the recirculating accumulator, more liquid will be held in the coil during light loads than during heavy loads. So when a sudden heat load is put in the cooler or freezer, liquid is displaced in the coils by increasing amounts of vapor. Liquid that is lying quietly in a line, when accelerated by the passing vapor will form waves, and will eventually close the pipe or evaporator tube with a slug. The slug pushes all of the liquid ahead of it, so that it is possible in extreme cases to flush a volume of liquid equal to the coil volume into the accumulator or low pressure receiver in a short time.

The remedy would be to erect a recirculating system without liquid traps between the coil entrance and the accumulator. Or where this is not possible, arrange to separate the liquid and return it from each trap to the evaporator by means of surge drums and gravity or force feed returns. A third remedy is to use an extra large accumulator.

— W.V.R., Chicago.

Oil in Evaporator

QUESTION: I am operating a Refrigerant-11 centrifugal compressor. I have added a lot of oil to maintain my oil level and I believe it is all going over and staying in the chilled water evaporator.

Is there any way to tell how much oil is in the liquid refrigerant in the evaporator?

What amount of oil will affect operating conditions?

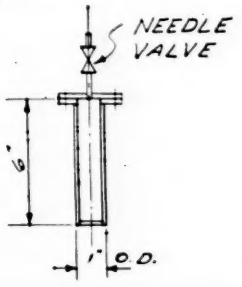
How can I get this oil out of the evaporator?

—N.M.D., Chicago.

ANSWER NO. 1: Since Refrigerant-11 is highly miscible with oil at normal evaporator temperatures, and since most of the refrigerant in a centrifugal refrigerating unit is in the evaporator, the oil which you added is probably mostly in the evaporator.

A small amount of oil in the evaporator will have little effect on its heat transfer characteristics. However, if the oil concentration in the liquid refrigerant, by weight, exceeds two or three percent the heat transfer rate will be measurably reduced. To test the concentration of oil in the liquid refrigerant use a sampling tube as shown:

Thoroughly clean the tube with solvent and weigh on an analytic balance. Fill the tube with the refrigerant-oil mixture and again weigh. Place a couple of layers of chemical filter paper over the needle valve outlet and bleed off the refrigerant vapor through the needle valve so slowly that no stain appears on the filter paper. Again weigh the tube and its contents.



The weight of the evaporated refrigerant will be the difference between the second and third weights. The weight of the oil will be the difference between the weight of the oil divided by the weight of the refrigerant.

If the concentration of oil in the refrigerant exceeds five percent I suggest that you see the dealer of your centrifugal unit with regard to distilling refrigerant from the oil.

—N.S., San Luis Obispo.

ANSWER NO. 2: One of the most important points brought out by the question was that the operator should record any addition or removal of oil from the compressor. Addition of excessive amounts can be checked immediately before operation is affected.

To check the quantity of oil in the refrigerant, draw off a sample from the evaporator. Use a glass container with a wide mouth like a large drinking glass. Measure and record the amount you start with. Place sample in a well ventilated room that has a temperature about (76 to 80°F). The refrigerant will slowly evaporate and the remains will

be oil. Measure the amount of oil left. Divide the amount of oil left by the first measurement, to get the percentage of oil in refrigerant.

There is a difference of opinion about the percentage of oil that can be allowed. Some say five percent others as high as 20 percent. All agree that 20 percent is maximum.

When a centrifugal compressor is shut down, do not permit cooling water to flow through oil cooler or seal housing. This will help minimize refrigerant absorption in the oil.

Watch the oil temperature on oil cooler during operation. It should be about 100° F. Don't operate at too low a temperature.

—J.P.P., Chicago.

Soldering Practices

QUESTION: What type material is recommended for soldering aluminum to aluminum, and for soldering aluminum to copper?

M.S., Jackson, Miss.

ANSWER: Soldering aluminum to aluminum:

Flux mechanically cleaned surfaces with any good commercial aluminum flux. Heat surface to be soldered to M.P. of solder (usual range —550° to 700° F). Take care that flame does not touch flux. When proper soldering temperature is reached the flux should fume or smoke. Apply solder to heated work. The joint should then cool slowly. All traces of flux should be removed after work has cooled. Recommended procedure is to wash with a 2% H_2SO_4 solution, followed by a 1% HNO_3 solution. And lastly rinse in warm water.

Soldering aluminum to copper: Tin surface of both metals separately—then join and finish soldering.

—T.G., San Luis Obispo.

String Bean Refrigeration

QUESTION: Kentucky Wonder Beans available in a growing area in Mexico, some 300 miles below Nogales, are transported into Los Angeles market by iced trucks. However, they are delicate to handle and quite frequently develop rust spots. Would vacuum cooling and subsequent bunker icing be a better refrigerated preservation method?

—J.L.D., Los Angeles.

ANSWER NO. 1: Vacuum cooling firms advise that they have had excellent results with beans provided they are good and wet at the time they are placed in the retort. Some products come from the field wet, while others have to be wetted down prior to vacuum cooling.

If the beans are dry no attempt should be made to cool them by the vacuum method. The reason for this, of course, is that moist and ample surfaces should be available for most effective vacuum cooling which is in effect a form of low pressure evaporative cooling. The TRRF Commodity Storage Manual indicates that the beans should be brought down to a temperature of 45 F as promptly as possible. Although it is desirable to keep humidity high rust can be avoided if kept below 95% r.h.

—J.R.K., Chicago.

ANSWER NO. 2: It is a mighty long haul for those beans. Containers in this case is as important as prompt and thorough cooling. Vacuum cooling will do very well if beans are moistened. However, keep water off them after they are vacuum cooled. Wet beans will have a greater tendency to rust than those that are vacuum cooled and sold relatively dry. However, they should be kept at cooler temperatures of 40 to 50° F.—H.C.D., Colo.

Air In System

QUESTION: What is the possibility of air entering a refrigerating system via venturi effect in high velocity suction lines operating at 15 psig; say through a cracked flange or a flared fitting?

—B.H., Nojave, Calif.

ANSWER NO. 1: If there is no fitting there will be no venturi effect regardless of what the velocity in the suction line may be.

Venturi action is produced by a change from a lower to a higher velocity. In accordance with the law of conservation of energy, the change of velocity must be produced by a loss in pressure. If there is no restriction at the flange or flared fitting there will be no increase in velocity; hence no loss of pressure, and hence no chance of air entering the system unless the pressure in the suction line were below that of the atmosphere.

—N.S., San Luis Obispo.

ANSWER NO. 2: The possibility of air entering a refrigerating system via venturi effect in high velocity suction lines is very remote. The flange or fitting would have to restrict the refrigerant flow so that the flow would be sonic at the restriction. This would lead to a large pressure drop and a loud shrill noise. The noise and the pressure drop would be more of a problem than the air leakage, if the fitting was cracked.—**R.G.R., San Luis Obispo.**

Hidden Mirrors

QUESTION: Insulation recently applied to an addition to my cold storage plant went over sheets of aluminum for exterior walls and under similar sheets for the roof. I applied the aluminum foil not only for its vapor barrier values but for reflective characteristics as well.

Later when I built a new home I tried to persuade my contractor to do the same. He argued that this practice had very little value in home construction and quoted me an exorbitant price when I asked him to investigate. Yielding to expediency at the time it was omitted. I have since felt I should have put time and effort into placement of aluminum foil or reflective surface between interior finishes and the fibrous insulation materials. Do you agree?—

B.C.M., Toledo.

ANSWER: Insulation goes into practically all of today's houses in the expectation that slowing up the rate of heat transfer will increase the comfort and economy derived from the heating and cooling systems. The National Bureau of Standards has reported, with considerable attention to technical detail, that proper application of aluminum foil or other reflective surface on such fibrous materials greatly increases their effectiveness in retarding heat flow.

—Ohio State University Research Foundation, Columbus, Ohio.

Do You Know A Better Method?

Many regular readers of the NAPRE Question Box have provided valuable suggestions based on their own operating experience, and we commend them for sharing their practical solutions through this medium of idea exchange.

Additional readers are invited to not only submit questions on their operating problems, but equally important, if you have a suggested solution to any question, we invite you to send it in and thus help a fellow engineer.

NEW QUESTIONS

Oil Removal With Safety

QUESTION: Not over a month ago our chapter instructor and a couple more experienced engineers advised that I should discontinue using my refrigerant pump-down compressor as an air compressor. When I wanted to blow oil out of my coils, because of the convenient piping arrangement, I have used the pump-down compressor to produce 100 to 125 lbs. air pressure for blowing air out of the coils. The instructor and these other engineers went to great pains to point out the hazards, for which I am thankful but still a little skeptical.

In another publication the other day, I read the following: "The coils were pumped out, disconnected and blown with compressed air at 125 pounds pressure to insure the complete removal of oil accumulations. Oil drains were installed and the drain pipe extended to the outside of the building."

The consulting engineer who wrote that not only enjoys a reputation of being an outstanding consultant but he is a member of the NAPRE National Educational Committee. I fail to see the difference between the practice I use and the practice he described. He apparently was getting air from another source, whereas I used my available pump-down compressor to obtain the necessary air pressure for oil removal. Can someone re-define the hazard in my operation, I seem to be missing the point.—C.P., Chicago.

Measuring NH_3 Service

QUESTION: Wouldn't it be more practical in measuring ammonia supplied to a customer from a pipeline, especially if he is a large user, to alternately feed an amount into a vessel and then discharge it from the vessel into the customer's service line? Specifically I am referring to Metering Ammonia question and answer which appeared on page 27 of the May issue of Industrial Refrigeration. It seems to me I saw a plant in California where such an arrangement was installed.—E.R., Chicago.

Grape Juice Cooling

QUESTION: Please settle a little argument for us. How many gallons of 55 F well water would be required to cool 600 gallons of grape juice per hour from 180 F to 60 F? This may appear to be one of simple mathematics but it has produced three different answers in our chapter.—D.D., Eau Claire, Mich.

Eutectic Tables Sought

QUESTION: Where can we locate a table that will show various eutectic compositions, or a list of salt solutions for use in eutectic plates which would be used for refrigeration effect at minus 10 to minus 20 F? Where can literature be obtained which would include corrosion prevention treatment for such solutions?

—B.B.C., Maracaibo, Venezuela.

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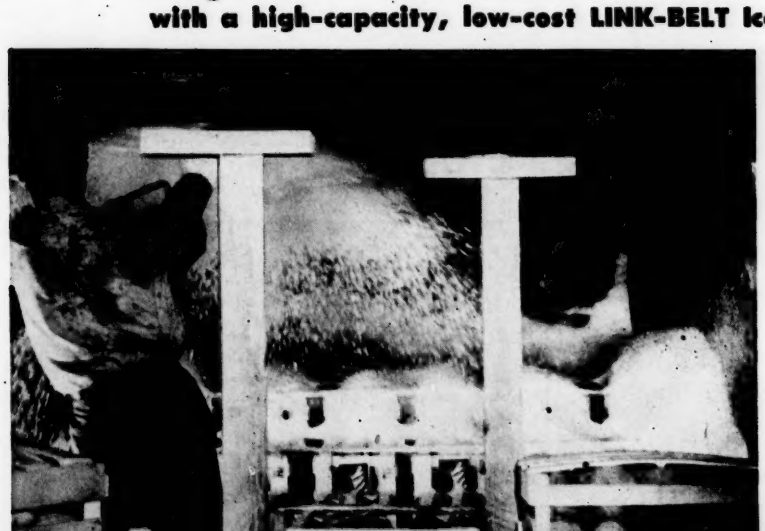

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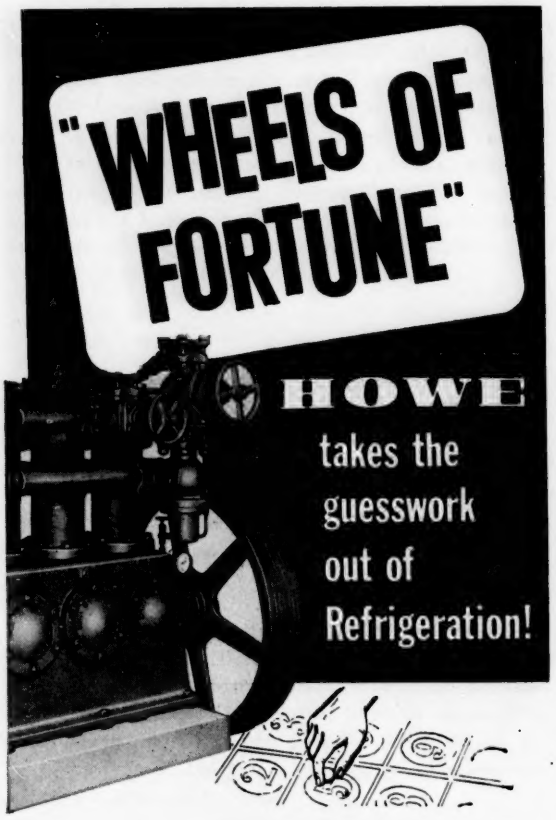

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New Questions

Advertising Slogan Appears to be Paradox

QUESTION: While discussing the use of an advertising slogan in connection with a canned carbonated beverage, I felt it necessary to obtain some clarification.

The slogan itself reads "Fast Cooling Aluminum Stays Cooler Longer". The slogan is in reference to comparison of other types of tin containers.

If the flow of heat from the beverage in an aluminum container travels fast in an outward direction, wouldn't it also travel fast in the opposite direction?

If the above slogan is correct, would the specific heat of aluminum be a factor in retarding the heat flow in one direction, or would the reflection of heat waves be considered the most important factor?—J.S.P., Hawaii.

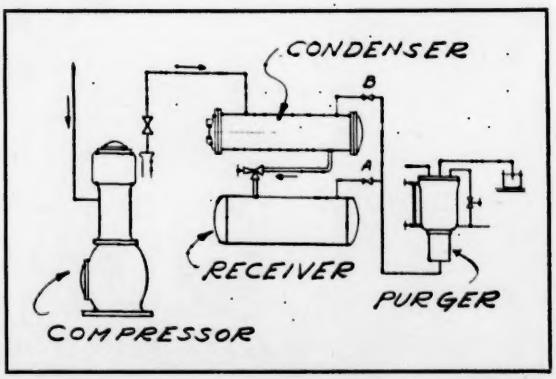
Adding Alcohol To A System

QUESTION: Recently a speaker before an engineers group stated that a lubrication manufacturer recommended addition of a small amount of alcohol in an ammonia refrigeration system. Intent was to prevent formation of detrimental deposits and to keep compressor rings free. What about this practice? Can any serious consequences result chemically or physically?—R.H., Chicago.

Correct Purging Point

QUESTION: When an automatic purger is used, is a purge connection from both the receiver and the condenser required? Or is the purge connection from the receiver only sufficient?

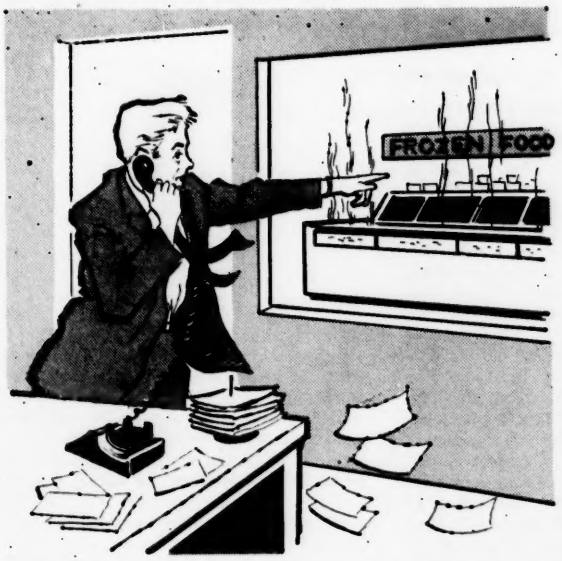
The following conditions are applicable:
(1) Only one condenser and one receiver are involved.
(2) The condenser is evaporative in one installation; shell and tube condenser supplied with water from an atmospheric cooling tower, in another.



Referring to the accompanying drawing, will purge connection "A" from the receiver give sufficient purging? Or, should purge connections be provided at "A" and "B", with purging being done either from the receiver or the condenser, as may be required?

—T.H.R.&D.D.W., Chicago

Closer Check on Frozen Foods Needed



▶▶▶ THERMOMETERS in frozen food cabinets cannot be depended upon according to the Association of Food and Drug Officials of the United States. A check of nearly 7,000 cases nationwide showed less than half at proper frozen food storage temperature. One-third of frozen foods displayed were above the frost lines of the cabinets. Results of the survey are expected to be of prime consideration in a possible model code for frozen food handling.

In a report presented at Las Vegas on June 18 at the Annual Meeting of AFDOUS, C. S. Brinsfield, chairman of the association's Frozen Food Standards Subcommittee, stated that grocery store managers should not depend on original thermometers. Releases covering the report did not indicate what the chairman suggested for checking temperatures, but accurate thermometers are available at small cost for such purposes.

Surveyors, most of whom were state and local food and drug officials, checked handling practices and the condition of frozen foods at all stages from arrival at the stores to the bagging operation. The stores were located in 34 states and the District of Columbia. Officials found one store in eight to have frozen foods either in stock or sales rooms under no refrigeration whatsoever. Temperature of more than half of the food had been allowed to rise above 5 F, maximum tolerable levels, to well over 26 degrees.

Tracing frozen food through the stores investigators reported that deliveries are received from refrigerated trucks in only 79 percent of the firms. Eleven percent received frozen foods which were not transported under refrigeration nor protected by insulation. Only one store in ten made it a practice to check the arrival temperature of the food, but practically all of the stores claimed all the food was still frozen on arrival! According to AFDOUS report existence of backroom storage facilities, even of the walk-in type is no guarantee of adequate protection. Seven of ten stores in the survey had storage but only three out of four of the facilities were found to have storage temperatures of 5 F and below.

Figures obtained from this survey will be used by the Task Force to Improve Frozen Food Handling established last year by the industry. This Task Force will promote proper handling of frozen foods. Sterling B. Doughty of Sacramento, California, is chairman of the Task Force.

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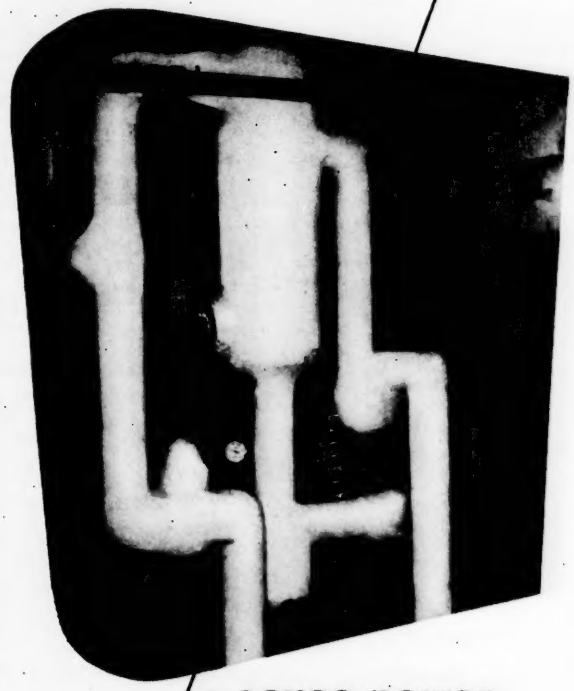

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All refrigerating engineers are invited to affiliate with the National Association of Practical Refrigerating Engineers, Inc., an educational association, "not-for-profit".

From the President's Desk

Congratulations Extended On RSES' Silver Anniversary

Frank L. Chase

▶▶▶ MEMBERS of NAPRE will be interested in the fact that a brother organization, the *Refrigeration Service Engineers Society*, concluded its 25th year in June 1958. Their official organ, REFRIGERATION SERVICE AND CONTRACTING magazine, also turned its Silver Anniversary in the same month. Their monthly publication, like that endorsed by NAPRE, is published by Nickerson & Collins Co. NAPRE extends its congratulations to both RSES and RSC.

The silver jubilee indicates that the association and the publication are surely doing a fine job for their segment of the industry. They do for commercial and domestic service engineers what NAPRE has done in the past 48 years in the industrial refrigerating field. They bridge the gap between the professional refrigerating engineers, the manufacturer and his jobber or distributor, and the owner and user of refrigerating equipment.

Suggests Fall Planning

July and August with over three-fourths of the 40 NAPRE chapters, means a vacation from regular monthly or semi-monthly meetings. However, this should not mean a cessation of chapter functions. Officers are expected to carry on their duties during these two months, and all chapter committees take on increased importance to their local membership at this time.

Reason for the increased importance is in two facts. When the chapter doesn't hold meetings, it comes about during the busiest and heaviest refrigerating period of the year. Therefore, the member in trouble cannot depend on obtaining help at a regular meeting and must look to the various committees to help him out in any predicament in which he may find himself.

The second reason why chapter committees are more important than ever during the summer months, lies in the fact that it is during this period that they plan the following season's work. In other words, during July and August chapter committees actually undertake an overhaul period with regard to the chapter program and educational functions.

Calendar Preparation

Now is the time for the chapter officers to hold a series of executive committee meetings and to bring in each of the major chapter committees for a review of last season's accomplishment, and the preparation of a program calendar for the year to come. The educational committee should line up an instruction program for the Fall and Winter meetings, and in some cases right through the coming Spring.

Instructors should be contacted again to learn of their availability, of any requests they have for additional instruction aids or material. The speaker program committee could receive a few suggestions from the educational committee with regard to tie-in speakers for certain meetings, and for the development of wider refrigeration knowledge through speakers on varied topics.

Guy R. King, NAPRE's educational vice chairman has just completed a revision of "Planning Chapter Program". A complete set of this six chapter series is available from the national office on request by the chapters. King very effectively describes the mechanics of planning and putting on the outstanding programs for which he has been known in the several California Chapters with which he has been affiliated.

Available Literature

Many of the chapters have not obtained literature from manufacturers, associations and various agencies that is described at the end of the chapters of the Basic Refrigeration Instructors' Manual. Summer recess is an excellent time to write for this material and have an adequate stock or supply of handout literature on hand when the Fall classes start. An example of an audio-visual aid such as may be obtained through the listings in the Instructors Manual, is an educational meeting guide on the subject "Pitfalls in Insulating Air Conditioning Systems". This aid is being made available to NAPRE chapters by the Insulation Division, Armstrong Cork Company, an Industrial Member of NAPRE.

The Armstrong guide, which contains a talk and 27 color slides shows the results of studies made by this firm's Research and Development Center. The color slides are of actual job installations, showing where insulation failed because of unexpected condensation or sweating, and where it was successful. The script describes the problems, pointing out why the particular installation failed and how it can be corrected. A factual, non-commercial presentation, it can be obtained through the national office. Further, some of the chapters have lost sections of the Instructors' Manual. These are also available from the national office at nominal cost. Your chapter should have 3 complete sets of 29 chapters each.

Frank L. Chase

News Notes and Chapter Activities

Regional Educational Conference By Northwest NAPRE Chapters

SEATTLE—Five Washington chapters, NAPRE, joined on June 7 in one of the biggest Regional Educational Conferences witnessed in the Pacific Northwest. Seattle Chapter was host to the affair which was held in the Mountain Room of Sick's Rainier Brewery, 3100 Airport Way.

Three technical papers were presented, followed by a panel discussion which reviewed them and a number of questions of area interest. An inspection trip was made of the boiler and engine room at the brewery immediately following the luncheon which served to break up the educational activities presentation.

Evening socials took place at the Towne House in Renton, Washington, with a social hour at 6:30 pm, followed by dinner, dancing and entertainment. Following registration in the morning the ladies were taken on a tour of Seattle points which included a trip to the Government Locks, Fishermen's Terminal, Aurora Bridge and the Floating Bridge. The Government Locks provide entrance with the ship canal to Seattle's fresh water inner harbors.

Other points of interest included the University of Washington, Campus Theater, Washington State Museum, Museum of Science and Industry, Henry Art Gallery, Aqua Theater, Seattle Art Museum and three of the city's major parks. The ladies lunched at the Jet Room, Bon Marche, from which they launched a shopping expedition before rejoining the men at the brewery enroute to the evening activities.

Three Major Talks & Forum

First paper presented was "Centrifugal Pumps in the Refrigeration Industry" by Bernie Terrant of Ingersoll-Rand. "Refrigeration for Fishing Boats and Fish Freezing" by Professor H. M. Hendrickson of the University of Washington, M. E. Department, was the second paper. Frank Knowles of Belt Ice Corp. presented a talk on "Future Trends in the Refrigeration Industry." Panelists were Jim Bennett, Tacoma Ice Co., moderator, the three speakers, Phil Gilmore of Portland Chapter, Howard Peterson, Yakima, Dick Quam, Spokane, Otto Stolz, Tacoma, and Falconer Anderson and Chuck Devine, Olimpia Chapter.

Auditorium facilities and luncheon were courtesy of Sick's Rainier Brewery Company. Sponsors of the educational conference were W. E. Stone Co. Inc., Belt-Ice Corp., Seattle Refrigeration and Manufacturing Co., Puget Sound Engineering, Inc., York Corp., Power & Controls, Inc., all of Seattle; Western Engineers Inc., Lewis Refrigeration Co., of Seattle and Portland; and Arthur Forsyth of Seattle, Spokane and Portland.

General Chairman of the conference was Bob Harrison, President Seattle Chapter; Educational Chairmen were Jim Bennett and Archie Waterbury of Tacoma chapter. Other chairmen were Publicity, Bob Jones, Olympia; Facilities, Howard Penor; Entertainment, Chet Bertus; Transportation, Sam Kramer; and, Registration and Finance, John Grainger, all of Seattle.—Bob Jones.

Oilers Stick to Books

TULSA—Spring meetings of Tulsa Chapter have been held in Room 107, Kendall Hall, Tulsa University. Holding two meetings each month, the chapter has devoted each to a chapter in Basic Refrigeration under instructor Donald E. Regenbrecht. Expansion valves and evaporators, operation of compressors, condensers and flow equipment have been the four principal topics. First meeting of each month has been devoted also to business and the second meeting has featured a half-hour safety talk.—Charles O. Underwood.

Modern Equipment Production, Refrigeration Museum, Features of Southern California NAPRE Plant Visit

LOS ANGELES—Two Southern California Chapters, NAPRE, made a joint field trip through the plant of the Recold Corp., Los Angeles, March 19. Since Recold is probably the largest manufacturer of refrigeration and air-conditioning equipment on the West Coast, an exceptionally large number of members and guests from both chapters took advantage of the opportunity to inspect this modern plant.

This field trip differed from the usual plant inspection tours made by the chapters. Previous field trips have been made to view the refrigeration and cooling facilities used in various manufacturing processes—beer, dairy products, orange juice and citrus concentrate, vegetable pre-cooling, etc. On March 19, however, the NAPRE members were able to see how coolers, blowers, condensers, evaporators, cooling towers and other equipment which they operate and service daily in their respective plants, are designed and built.

Pre-planned For Efficient Touring

Of interest, too, to officers of other chapters may be the highly effective and business-like manner in which the field trip was arranged between the two chapters' representatives and H. T. Jarvis, president, and Hal Jarvis, vice-president, and other top-echelon executives of the Recold Corp. Arrangements for this tour may well serve as a model to be followed by other NAPRE chapters. Secretary Donald H. Byl of Los Angeles Chapter collaborated with Recold officials by including in the mail announcement to Los Angeles and Colton members, a return post card so that Recold could prepare visitor's badges with the name and company affiliation, and Chapter name, of each person making the tour.

The Recold organization went to considerable trouble to assure a smooth and uninterrupted flow of visitors through the 120,000 sq ft plant. The complete route included 20 different stops to view as many operations. Fifteen engineers of the Recold Corp. and Thermo Products Co., the Recold distributor, served as guides. NAPRE members were taken through in small groups of 12 to 15 per party, beginning at 6:30 p.m., with one group following the other at 10 minute intervals. William Semple, Recold, served as floor co-ordinator to advise of traffic bottlenecks and to arrange for slowing up one group when it seemed in danger of catching up with the one ahead.

The fifteen groups were routed through the following departments: punch presses, draw bench, header soldering, arc welding, heavy assembly, blower coil assembly, warehouse, angle iron press room, spray booth, degreaser room, butt welder, gun spot welders, power brake department, drafting division, research laboratory and refrigeration museum. Recold, the visitors were told, was founded in 1932 by H. T. "Hy" Jarvis as a one-man, one-bench shop which manufactured only gravity fin coils. Today the firm produces one of the broadest lines of equipment in the air conditioning and refrigeration field.

Plant in Full Operation

The tour began with the visitors being shown how the raw material is brought in by truck and rail, and stored in the raw material area. Material consists of steel and copper tubing, steel and aluminum sheets, strip aluminum in coils, and angle and channel iron. The material moves from that point to cut-off saws and presses, and on to the power shears and brakes. NAPRE engineers were able to see the plant in actual operation, in the production of parts and the assembly of finished machines.

Of considerable interest to the engineers who operate and maintain evaporative condensers as part of their daily jobs, was the process showing how full lengths of steel tubing are bent to form sections for ammonia condenser tube nests. As one full length of tubing is used to start shaping of a section, additional lengths of tubing are butt-welded to make one continuous section. Sections are subsequently assembled and welded into complete tube bundles, and then hot dipped galvanized.

At the next stop in the tour, members were shown how fins for ammonia coils

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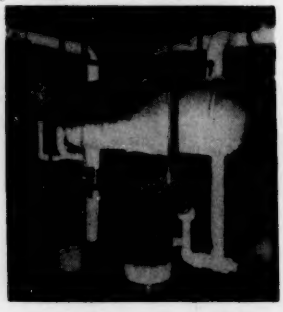

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NAPRE brass receives attention of William Semple, works manager: l. to r. Guy R. King, Chairman, Nat'l Educational Committee, Mike Julius, Pres., Los Angeles, and John Finfrock, Pres., Colton Chapters.

Sherman Singer, air conditioning products manager, reaches over Guy R. King's shoulder to explain a pertinent point in the soldering of tube turns on a halo-carbon evaporative unit.

are punch-pressed automatically from steel coil stock. Fins are punched with tabs for self-spacing (4 fins/in). Fins for halo-carbon refrigerant coils are automatically punched from aluminum coil stock. The aluminum fins are formed with extruded tube holes or collars which serve the dual purpose of accurately controlling fin spacing (8 fins/in) and of providing a good bond which will not chafe or cut the tube. The Co.'s guides explained that the dies for both the aluminum and steel fins are designed to produce individual fins cut to any required dimension, and to stack them.

One of the more spectacular operations observed was manufacturing of steel return bends. Tubing is drawn around a dye through a 180 degree bend. The "u" thus formed is followed by a 180 degree bend in the opposite direction. This operation is repeated until a full length of steel tubing is formed into a serpentine shape. This shape then is laid flat on a friction saw and is cut through the center to form individual 180 degree return bends.

Copper coil headers made in the Recold plant are with holes hydraulically punched and intruded for better joints at junction of tubes and header. The collars, too, are hydraulically extruded, or drawn, for better joint at the junction of the liquid or suction connection and the header. The ends of the header are then capped.

Low pressure refrigerant men among the NAPRE group had their innings in the department where tubing for halo-carbon coil sections is mechanically expanded within the stacked fins to give a coil a uniform tight bond between the copper tubes and the aluminum fins. Guides explained how the expansion is accomplished by simultaneously pull-

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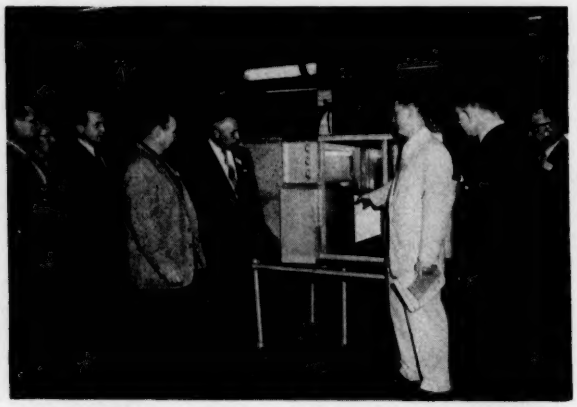

Inside information is given NAPRE tourists on the operation of a multi-zoned air conditioner by Robert Harsh, engineer.

Structural details of a Dri-Fan evaporative condenser is explained to one of the 15 groups by Frank Stewart, sales order department mgr.

ing expander rods through all tubes of the coil in a single stroke or "draw", on a 140-foot drawbench. A tungsten-carbide expander ball at the end of each draw row is opened or expanded to assure a uniform inside diameter as they are drawn through the tubes. The bench in the Recold plant will expand up to 40 tubes at one time.

Copper brazing material and special torches are used in brazing copper return bends to the coil tubes. On ammonia coils, steel return bends are welded to the steel tubes. All coils are sealed and submerged in water to test for leaks with 300 psig air. Each of the 15 touring groups of NAPRE members were given a demonstration of coils under test in a 20-ft long water tank.

Next operation inspected was the dehydrating oven in which the coils, after testing, are dried out under high temperature. When coils are removed from the oven, they are blown with a blast of dry nitrogen and the ends are sealed to prevent entrance of dirt or moisture. Arc welding department was viewed next in which heavy angle iron frames for air conditioning equipment, floor units, evaporative condensers and cooling towers are welded.

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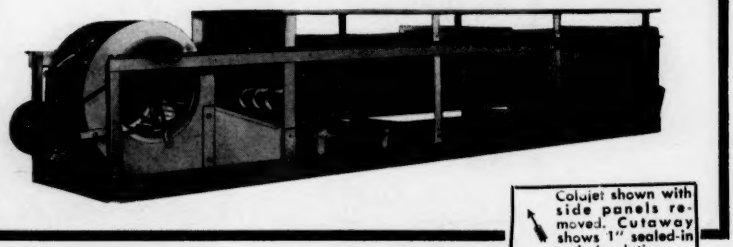

Coldjet shown with side panels removed. Cutaway shows 1" sealed-in cork insulation.

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Headers From Two Forms

A novel method of construction is used in this plant for production of all-steel ammonia condenser headers. Steel tubing of the bundle is brought through holes in channel iron which is cut to length. Tubes butts are arc-welded from the inside of the channel and flame-welded from the outside to seal the joints. A header-length of half-round section of steel pipe is then seam-welded to completely enclose the header.

In the assembly department the visitors were shown how component parts are assembled in air-conditioning equipment, floor units, condensers and cooling towers. The Recold Co., the guides advised, builds a line of units including air-conditioners ranging from 1200 to 32,000 cfm; halo-carbon evaporative condensers from 5 tons to over 140 tons capacity; ammonia evaporative condensers from 3½ tons to 175 tons; and floor units from 2 to 12½ tons capacity.

Various sizes of ammonia water defrost blower coils, which are used extensively in industrial refrigeration applications, were being assembled on the blower coil assembly line to give the NAPRE visitors an idea of how this part of the unit is put together. It was noted that the coil sections had been given a hot-dip galvanize coat after fabrication for protection against rust and corrosion, and to form a permanent bond between the tubes and the fins.

The plant is equipped with degreasing and spray painting facilities where non-galvanize finished parts are cleaned and given protective primer coats and hammertone finish coats.

Research Lab & Museum Stops

Part of the tour was an inspection of the company's 18,000 square foot warehouse where complete units of blower coils and small evaporative condensers are stored. The NAPRE engineers inspected a new 150-ton ammonia Dri-Fan condenser which was put through tests while the tour was in progress.

Second last stop took the visitors into the Co.'s research laboratory. There Harold Halls demonstrated Vapo-matic and Deltric defrost systems, and David Brainard, laboratory supervisor, ex-

Operation of a now historical Crosley Icy Ball refrigerating unit is explained by Dan Wile, vice-president and chief engineer.

Galvanized drain pan of a 25-ton product cooler used effectively with earliest form of expendable refrigerant for chilling beverages.

plained the other research facilities. The laboratory, according to Brainard, was one of the first equipped to test and rate coils in accordance with ASRE standards. During the tour, tests were conducted on blower coils with various refrigerants and capacities.

Last stop was in the Recold refrigeration museum which is housed in a building adjoining the plant office division. The museum was founded several years ago as a hobby by Recold's president, H. T. Jarvis. He has received additions to his collection from many parts of the world. Some of the unique pieces on display are:

An original Creamery Package ammonia compressor; a ¼-ton machine built in 1900 by the Socold Co. and used as late as 1920. Another item is a Whirlwind Fan, said to be the granddaddy of all air conditioning equipment. It is a 16-in fan run from a kerosene lamp and was used prior to the turn of the century in the deluxe cabins of Great Lake steamers, as well as in some offices and homes. Another interesting item in the museum is a wooden engineering drawing—a wooden board 12x20-in with detailed engineering designs on both sides. It was used by the York Corp. prior to 1890, as an engineering design for an ice machine.

Members of the Recold organization who served as guides in addition to those mentioned were: Daniel Wile, vice-president and chief engineer; Sherman Singer, manager of air conditioning products; Frank Stewart, manager of order department; and engineers Robert Harsh, F. Mazzota, H. Fehr, J. R. McDonough, Tony Telles, A. Howell, P. Kilgore, and George Paradise. Recold Corp. is a Sustaining Industrial Member of NAPRE, and was the first Sponsoring Member until upgrading of their classification last Fall.

—Fred Herr.

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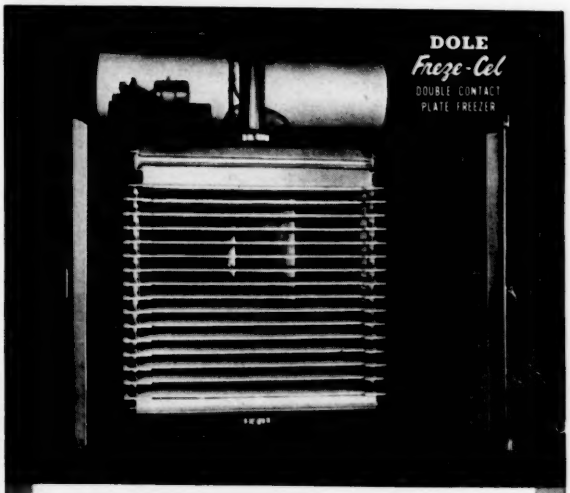

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Miami Airport Ready For NAPRE Conventioneers

▶▶NORTH MIAMI—Among the many sites to be witnessed by attendants at the 49th Annual meeting of NAPRE to be held in Florida November 11, 12 and 13, is the new Miami International Airport. The huge terminal building serving five major wings will be air conditioned, of course.

The old Miami International Airport Terminal was fast becoming inadequate. The Dade County Port Authority and the County Commissioners resolved to build a new terminal which together with roadway system and parking facilities will cost some seventeen million dollars. The International Terminal Building to house all offices of the Port Authority and all the tenant air lines, is still being constructed and is expected to open late in 1958. This new terminal building has a spread on the first and second floors of over one-quarter-mile. Ticket counters, restaurangs, snack bars, cocktail lounge, baggage rooms, barber shop and all public services will be tenanted on these two floors.

Within the Terminal Building there are three centrifugal compressors, each driven by a 600 hp motor and with a total capacity of 1800 TR for air conditioning. Air cooling is actually by a chilled water system supplying 74 air handling units at 50 stations throughout the building. More than twelve miles of duct work to distribute the cooled air from these units has been installed, and eight miles of chilled water piping supplies the cooling coils of the system.

There are 96 thermal controls throughout the building to keep the temperature at a fixed degree for comfort. The central control panel will be equipped with indicators showing which units and equipment are in use. Three 600-ton capacity towers have been installed on the roof to cool the condensing water. Four circulating pumps keep the water flowing between the chiller and air coolers, and from condensers to towers. A 350-KW emergency generator powered by a Caterpillar Diesel engine has been installed for emergency lighting and one elevator.

The control tower rises above the airport some nine stories. The Terminal Building's main runways will be extended and the landing field, which is already six times the size of New York's La-Guardia Airport, will be enlarged. An automobile ramp about three quarters of a mile long will facilitate passenger movement to and from the second floor, where the main lobby will be located. There are 19 escalators and three elevators making up the major part of the equipment which serves the building.

—CHARLES W. MONEYPENNY.

Local Fish Food Firm Gets Wide Publicity

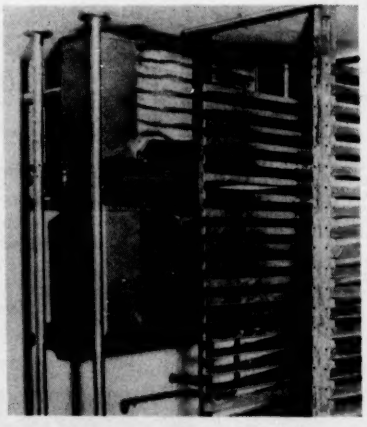
▶▶OAKLAND—Uniquesness helped a Hayward, California firm get national recognition recently and also brought a certain amount of publicity to an associate member of California Chapter No. 1, NAPRE. Brine Shrimp Sales Co. is the firm and the associate member is William Wurzbach, Oakland wholesaler. The product is a packaged frozen fish food. A release from a nationally known agency in the East describes the plant as being the only one of its kind in the world.

Brine shrimp, tiny creatures less than a quarter inch long, are packaged and frozen for sale as fish food. They are gathered in the salt beds of San Francisco Bay with fine mesh nets. Each day's catch, which may range from a bucketful to several barrels, is brought to the plant, washed and immediately frozen. Contractor Don Weisse called on the San Francisco Chapter member Wurzbach for some suggestions with regard to heat transfer calculations when faced with this rather uncommon problem. Basic, of course, was calculation of the product load. Determining this was no easy task, however, the problem being how to determine what fraction of a Btu is required to freeze such a small creature. Also, how many of the shrimp are there in a 3" x 3" x ¼" package?

Equipment Selected

Floor to ceiling pan racks were constructed in an insulated room, very similar to the tray racks used by bakers and confectioners. Packages of the fish food to be frozen are placed in the trays and the sub-zero air is circulated over them from two Dunham-Bush electric defrost units. Employing a patented inner-fin construction in the units, made for simplification of the installation, and to further conserve space, the two units were mounted one above the other on a pipe rack similar to those found in freezer storage and provisioners' refrigerators.

The same idea of stacking equipment was applied to the low temperature condensing units which consisted of two Brunner-Metic 2-hp air cooled units housed in the equipment shelter in the corner of the building adjacent to the freezer room.



At left, contractor Don Weisse holds a sample of the shrimp package which is placed on the trays for freezing. Right, double decking arrangement of blower coils in the freezing room at Brine Shrimp Sales Co., Hayward, Calif.

Past President Passes

Sacramento, San Francisco and Twin Cities Chapter of NAPRE were saddened in April with the news of the decease of **Frank Cordoza.** A heart attack took Frank on April 15. He had been a member of NAPRE for 14 years, joining originally at California No. 3, Sacramento.

Frank had most recently been District Engineer for Foremost Dairies, traveling from St. Paul, Minn. to Hawaii, T. H., but headquartering in San Francisco offices of the Golden State Co., Ltd., a Foremost Div. He is a past president of California No. 1, San Francisco and served alternately on the national publications and educational committees, NAPRE.—LEROY ETZEL.

Installation Details Are Manhattan Topics

▶▶ NEW YORK CITY—How important are those seemingly small details? Pretty important when you spend $20,000 in cleaning and repairing a practically new plant! Especially when the new plant only cost $40,000, first cost.

Such an overhaul expenditure was necessary, according to Wally Smith, General Chemical Div., Allied Chemical Corp., because proper precautions were not taken to clean and dry the new system before it was charged with refrigerant. In addition to relating this anonymous incident (but spelling out the details nevertheless), Smith distributed some follow-up material which should prove informative and useful to members attending the late May meeting of the New York Chapter.

Another welcome guest at that meeting was Ervin Walvotne of Electric Machinery Mfg. Co. He discussed power factor and large synchronous motors. In addition, each member present received three booklets: "The ABC of Synchronous Motors", "The ABC of Power Factor" and "The ABC of Large A-C Motor Controls". These booklets are well done and probably contributed better understanding of the electrical equipment on the part of many members of the chapter, especially in view of the dearth of this type of publications for refrigerating engineers.—QUAID MINICH.

Colton Learns Cryogenics

▶▶ SAN BERNADINO—Spring meetings of California Chapter No. 5 were among the most interesting presented in recent years. In March, Larry Benedict of the Benedict Company, Los Angeles, applicators of Vapo-Wall insulation, and Bob Wheelock of Wyle Cryogenics Laboratories, presented a dual program. Benedict presented a number of slides in which he depicted the correct method for applying expanded polystyrene insulation to very low temperature piping, valves, tanks and drums. The scenes depicted were the liquid oxygen and nitrogen lines and vessels at the Wyle plant at Norco, Calif.

Rocket Controls Tested

Wheelock followed Benedict and using the same type of slides narrated an interesting series on the testing of equipment for handling and controlling the flow of liquid gases and fuels. Specifically the equipment tested at this facility is for rocket engines. The Los Angeles correspondent of NAPRE's official organ was present and a detailed description of the Norco plant operations will appear in a summer edition.

At previous meetings Benedict had also been the guest speaker, instructing members on the correct applications of insulations to pipe both above and below freezing temperatures but not at extreme temperatures of the Wyle plant. He had served as emissary from the NAPRE chapter at Los Angeles with an invitation for the Colton Chapter to join with others in a tour of the Recold plant, which invitation was gladly accepted. A description of the tour is covered elsewhere in this issue.

Daly Re-visits

One of the most colorful and historical speakers for the Calif. No. 5 Chapter was John F. Daly, Alhambra, Calif. Since Daly is now a member of California Chapter No. 2, the members at Colton classified him as guest—but a very special guest since John was the third president of Chapter No. 5 and served a term of three consecutive years in 1927 through '29. Daly did a great deal of work in the Colton area, organizing the chapter and carrying on as educational chairman for a number of years. He retired last year as supervising engineer of the Santa Fe Railway Company ice manufacturing and cold storage plants.

Naturally his talk dealt with local problems. The question and answer session was beneficial to all members who operate in the same spheres. All meetings, with the exception of the field trip, were held in the Santa Fe ice plant lunchroom and closed with the usual refreshments and social period.

—HARRY BONTER.

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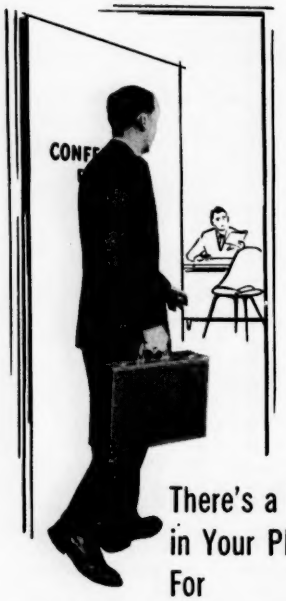

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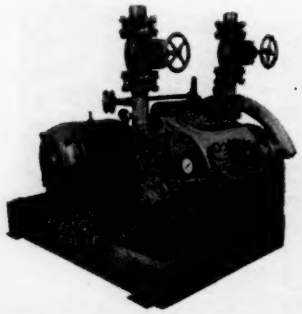

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Members-at-Large, NAPRE

New Zealand President Comments on Affiliation

DETROIT—Pinch-hitting for NAPRE's second vice-president is a pleasure but not a new experience for the first Veep. Between impending transfers to one of several bigger hotel berths and new construction in his present chief's assignment, John Mariakis figured it best to ask for a substitute columnist. The situation provides a chance to publish a letter from a distinguished NAPRE Member-at-Large in New Zealand.

J. Louis Gichard, President of the New Zealand Institute of Refrigeration Engineers writes:

"Last year I received a letter dated February 1957. Shortly after its receipt, I was ill for a period, and on my return to the office, the letter seems to have been put away, and overlooked. I regret this apparent lack of courtesy on my part in not replying earlier. It is very pleasant to realize that NAPRE takes an interest in members in other countries.

"You desire some personal information on myself. Well, to start with I am one of the 'oldsters', well past the three score and ten, in age, but do not yet feel that old. Am still in practice as a consultant engineer, but dodge a lot if I can, or pass it on if possible.

"I started my career as an engineer in my country, that is New Zealand, as a mechanical engineer. Went to sea as a marine engineer at 22, during which period I was engaged on a ship chartered by the Munson Line of New York, from an English firm in London. We were in the sugar trade from Cuba to Boston and New York, and Sicilly, ditto. On one trip we piled upon on Florida reefs, but got off, and returned to England to refit. Completed the charter, about 1908. Some time ago.

Meat Freezing Specialist

"After getting my 1st marine certificate in England, I returned to New Zealand and decided on a shore life. Joined one of the big meat freezing works here, as watch engineer. Changed my job as long as it gave me advancement, and at 31 was chief engineer of a large works. On from there to superintendent engineer. Then took a time off, passed through New York again to Europe, on a year's holiday. Again returned to New Zealand. Took up practice as a private consultant, specializing in refrigeration.

"We had an Association of Refrigeration in N.Z. of which I was a member. Later became president. We then decided to turn it into an Institute of Refrigeration Engineers in 1945. Was elected president, and have continued in that office since then. Have tried to pass it on, but the youngsters still think I should hold the job. We are the group of engineers that represent refrigeration engineering in this country. When we started there was no one to speak on behalf of the industry, or its engineers.

We now are accepted as the authority. We got refrigeration engineering recognized as a separate branch of engineering. Got laws made to enable the trade to have a measure of protection, for its members. Generally we have raised the status, and the standard of the profession in New Zealand, to the general advantage of everyone. We are still advancing in that direction, and for a higher standard of education in our technical schools and universities.

"Our membership is approximately 450 in all grades. We correspond with all other countries, and exchange proceedings, and information. In the practice of refrigeration engineering we are very advanced, both in the meat freezing and dairy product freezing, and in the latest of quick freezing technique. Our exports overseas last year, under refrigeration, was approximately $393,400,000. We have now developed quite a trade with your West coast in frozen beef, and some frozen lamb also. Some of our development and technique are adopted by your country, as well as in others. Our engineers trained in refrigeration, can be found world wide.

WW II Assignment

"During the last war I was placed in charge of the whole of refrigeration in this country, to see that it was maintained, to supply food to England, and the armed forces in various areas. During that period, your forces came to N.Z., and I had the job of handling food products for them, both frozen, and dehydrated. I met many of your armed forces in connection with this work, and am pleased to say, that at times still receive messages from some of them. I had the pleasure of taking some of them, who were bitten with the same bug as I have, *'fishing'* to our lakes, and introduced them to rainbow trout of 8- to 10-lbs weight, limit of ten.

"New Zealand is comparatively a small country. As we have to export to live and our country being very fertile and well husbanded, we are able since 1883, to maintain our national economy by means of our exports of primary products, under refrigeration. So refrigeration has been the prime factor in the advance of this country. With our population of approximately 2¼ million people, we have a big overseas trade or exchange of goods, including quite a bit with yours. Incidentally you will find that there are quite a few New Zealanders holding posts of importance in USA. And, by the way, Col. Jack Lanterman, your Military Attache, is my next door neighbor, and we are good friends.

"This will give you a short outline of me personally, and of our activities in refrigeration. I cannot see that we can have any form of conection, closer than a somewhat loose 'affiliation', but we welcome that, and are always willing to assist in any way in advancing the use of refrigeration, and of the status of the engineers engaged in it."

Thus, another Member-at-Large becomes better acquainted—Roy Burns.

Illinois Association Elects Lamb President

▶▶▶ MEETING in May at Decatur, Ill., the Illinois Association of Ice Industries elected new officers and enjoyed a program of some 18 events which were outlined earlier in INDUSTRIAL REFRIGERATION. Officers for the ensuing year are President Charles Lamb, Public Ice Service Co., Herrin; Vice President Marvin Verry, Central Illinois Ice Co., Springfield; Secretary-treasurer W. D. Wright, Clinton; and, Chairman of the Board Karl Pflanz, St. Clair Ice Co. Belleville. Directors of the association are the officers and the following: John Glenn, Beardstown Ice and Fuel Co., Roy Smith, Western Illinois Ice Co., Galesburg, G. C. Benson, Harrisburg Ice Co., Richard Beard, Beard Ice Co., Danville, R. G. Maginnis, Lincoln-Boyle Ice Co., Chgo., Wm. Tolle, Tolle Ice, Mattoon, and Reed Smith, Peoria Service Co.

Michigan Industries Hold Annual Meeting

▶▶▶ MID-MAY was the date and Detroit-Leland Hotel was the site for the annual meeting of the Michigan Ice Industries Association. Directors elected for the ensuing year are Douglas Taggett and Edward W. Jackson, Kalamazoo Ice & Fuel Co., Eugene T. Scott, City Products Corp., Grand Rapids, John MacKellar, Detroit City Ice & Fuel Co., Wesley H. Brown, Brown Ice & Coal Co., Benton Harbor, Leonard Borin and Max Borin, Borin Brothers, Detroit, and O. A. Weber, City Products Co., Flint. Following the election of directors by the Association, the board met and elected the following officers for 1958-59 year: President, Douglas Taggett; 1st Vice-president, Eugene T. Scott; 2nd vice-president, John MacKellar; and Secretary-treasurer, Edward W. Jackson.

Arkansas Sets Ice Shipping Rate

▶▶▶ PEACH Harvest season at Nashville this year brought about a transported ice rail rate establishment by the Arkansas Commerce Commission. The rate set was one cent a ton a mile for 161 miles which the Missouri Pacific Lines transports ice from Pine Bluffs to Nashville. Ice previously had come from an ice plant at Texarkana which was recently destroyed by fire.

What Price Curling

▶▶▶ SPRUCE Grove Curling Club at Edmonton, Canada is constructing its own artificial ice plant for a four-sheet installation. Cost: $17,000.-00. To finance the sheets the club is selling 100 playing rights tickets and 100 10-year debentures bearing five percent interest.

BOOK REVIEWS:
Materials Handling

▶▶▶ Second and final volume, MATERIAL HANDLING APPLICATIONS by D. Oliphant Haynes, is the companion issue to MATERIALS HANDLING EQUIPMENT published a year prior. Both publications have been reviewed by executives and engineers in the refrigerated warehousing industry at the request of INDUSTRIAL REFRIGERATION*.

Operations Manager for a large cold storage firm operating some eight plants from Chicago through Texas, offers the following comments: "I found Haynes' books very complete and very informative. They were so complete that if a refrigerated warehouseman were to sit down and let his imagination run, he will find many applications for the systems described. I personally would like to have a set of these books in our company library.

"The book on equipment has every conceivable piece of material handling equipment from day one, to the present. In the warehouse business it is important to keep up with all types of equipment as you cannot be a specialist in any one thing, and by using this book as a reference, systems can be developed for handling each type of container in a warehouse."

Vice-president and general manager of one of the first single-story refrigerated warehouse structures in the United States had this to offer: "It appears to be a comprehensive treatment of the subject, and in my judgment, would be a valuable addition to the library of anyone with responsibilities in this field."

His chief engineer spelled out in detail where books would be helpful to IR readers. "Materials Handling Equipment; Chapters 36, 37, 38, 39, 42 and Appendix. Materials Handling Applications; Chapts. 29, 31 & 32."

MATERIALS HANDLING APPLICATIONS, $12.50
MATERIALS HANDLING EQUIPMENT, $17.50
Author: D. Oliphant Haynes, Publ'r: Chilton Book Div.
Both purchased as a boxed set, $25.00

*As a service to its readers INDUSTRIAL REFRIGERATION invites three or more executives and engineers in a specific field to review actual publications where the publishing house offers material for review.

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Conrad Hilton Hotel, Chicago, Ill.

DAIRY INDUSTRIES SUPPLY ASSOCIATION
Congress Hotel, Chicago, Ill.

MILK INDUSTRY FOUNDATION
Hotel Sherman, Chicago, Ill.

INTERNATIONAL HEATING AND AIR CONDITIONING EXPOSITION
January 26-29, 1959
Convention Hall, Philadelphia
E. K. Stevens, Manager

INSTITUTE OF AMERICAN POULTRY INDUSTRIES
February 13 to 15, 1959
Municipal Auditorium, Kansas City, Mo.

THE REFRIGERATION RESEARCH FOUNDATION
April 2-5, 1959
Statler and Mayflower Hotels, Washington, D.C.

NATIONAL ASSOCIATION OF REFRIGERATED WAREHOUSES
April 5-9, 1959
Statler and Mayflower Hotels
Washington, D.C.

NATIONAL EXPOSITION OF POWER AND MECHANICAL ENGINEERING
December 1-5, 1958
New York Coliseum, New York, N.Y.
E. K. Stevens, Manager

MANUFACTURERS' NEWS

Allied Modifies Name

▶▶ DIRECTORS of the Allied Chemical & Dye Corp. in March proposed the name of the firm be changed to simply Allied Chemical Corp. which would more clearly reflect the broad nature of the company's position in the chemical industry. The recommendation was referred to the holders of the company common stock for approval, and the change of name became effective in May.

Allied's six operating divisions and about 30,000 employees produce some 3,000 products in more than 120 plants, laboratories, mines and quarries. In addition to its position as a leading manufacturer of basic chemicals for many industries, Allied Chemical Corp. has developed such new products as aerosol propellants and refrigerants, polyethylene, isocyanates for flexible and rigid uretane foams (including low temperature insulations), caprolactam for nylon fiber.

Nitrogen Division, Anhydrous NH_3 Appointments

Barrett Brand anhydrous ammonia is a product of the Nitrogen Division, Allied Chemical Corp. In recent months there have been a number of new agents appointed for handling this product in cylinder sales. P. G. Walker & Son, Inc., has been appointed agent in the quad-state area of southwestern Missouri, Arkansas, Oklahoma and Kansas. They will maintain cylinder stocks at their warehouses in Springfield and Joplin, Missouri.

Three branches of Thompson-Hayward Chemical Co. in Arkansas, Missouri and Texas have been appointed as agents also, and will maintain stocks at Little Rock, Kansas City, Mo., and Lubbock, Texas. In Charleston, S. C., and surrounding counties, Thomas W. Carroll Inc., will handle the product. In New York City, Davies Nitrate Co. Inc., represents Allied's Nitrogen Division.

On the research side, Allied operates 12 laboratories which employ more than 1600 chemists and technicians. At present, an estimated two-thirds of the Company's research budget goes into the development of new products and processes. The remaining one-third is used for improving existing products. Research expenditures at Allied have grown from $8 million a decade ago to $17.5 million. In the same period, the Company's sales have risen from $387 million to $683 million.

New Officers for Mercoid

▶▶ ELECTED to executive office by the board of directors, Mercoid Corp., at the annual meeting held this Spring were: Hugh Courteol, Chairman of the Board, J. F. Chambliss, President and Treasurer, W. L. Colterjohn, W. K. Stauffer, R. F. Fisher, W. E. Jones and P. J. Provost, Vice-presidents, and Paul Courteol, Secretary.

Research Advancements

▶▶ ARMSTRONG Cork's Director of Research, F. B. Menger, announced recently that A. R. McGarvey has been named acting manager of the Industrial Insulation Dep't., Building Materials Research, and C. L. Carlson, acting manager, Adhesives Dep't., Industrial Products Research. McGarvey and Carlson will act as replacements for H. C. Brown, Jr., and G. W. Koehn, who have been promoted to marketing research assignments.

Dunham-Bush Streamlines

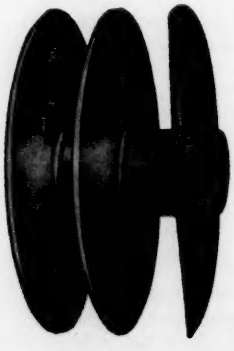
▶▶ SHEET metal forming and coil fabricating operations at Dunham-Bush, Inc., have been consolidated at Michigan City, Ind. Removal of this type of production at West Hartford permitted transfer of air compressor and open type condensing unit manufacture to the West Hartford plant. The Utica plant, scene of former compressor operations, will be sold. All research and development activities are to be centralized at West Hartford, and executive offices of the company will continue to be located there.

Dow Launches Approved Contractor Program

▶▶ APPROXIMATELY 50 qualified insulation contractors throughout the US will become company-approved installers of Styrofoam, Dow's expanded polystyrene insulation material, before mid-summer. The program is a contractual arrangement between Dow and application contractors with the primary objective being expert installation of the product. Under the agreement, the manufacturer will furnish contractors with technical information and merchandising aids. The contractor agrees to install the product according to the manufacturers recommendations and correct any failures due to faulty workmanship. A "Mark of Approval" emblem will identify designated contractors. Contractors will display the emblem on all installations they make. The program has been successfully tested in the New England area and is reported to have met with enthusiastic reception on the part of customers.

DIMCO CAST ALUMINUM FIN EVAPORATING COIL

The Ideal Refrigeration Surface for Cold Storages, Freezer Plants, Dairy Abattoirs, Breweries Products, Packing Houses, and numerous applications



* *Saves Space*
* *Saves Weight*
* *Saves Cost*

CAN BE USED WITH ANY REFRIGERANT

DETROIT ICE MACHINE COMPANY
2615 Twelfth St., Detroit 16, Mich.

Write For Descriptive Folder

CATALOGS AND BULLETINS

Protecting Frozen Foods

▶▶CATALOGS, bulletins, reprints and releases of various types are in profusion. Government agencies, research organizations, manufacturers, service firms, and associations are all producing helpful literature in quantities which are seemingly so numerous that there isn't time to review all of them. One government department releasing a number is USDA, through the Agricultural Research Service, and the Marketing Research Division of the Agricultural Marketing Service.

Protect Frozen Foods from Temperature Damage is the title of ARS-74-9, an 8-page bulletin that summarizes the Time-Temperature-Tolerance project of the Western Regional Research Laboratory, Albany, Calif. The bulletin is an excellent help to the many thousands who handle frozen foods. It contains the facts on kinds of quality loss, and the rates at various temperatures encountered in common mis-use.

Apple Publications

▶▶COMPARATIVE Costs of Handling Apples at Packing and Storage Plants is the title of the Marketing Research Report No. 215. For sale by the Superintendent of Documents at 45 cents, it is the 5th report published by the Agricultural Marketing Service of data submitted by the Washington State Apple Commission. Handling and Storage of Apples in Pallet Boxes is an interim report (AMS-236), and is based on research directed cooperatively by the Agricultural Marketing Service and the Agricultural Research Service. Another helpful publication is a 10-page bulletin AMS 232, A Warehouse Layout for a Fruit and Vegetable Service Wholesaler in a Terminal Market.

Another USDA Service

▶▶MONTHLY, USDA publishes AGRICULTURAL MARKETING which carries a yearly subscription rate of $1.50, domestic. Although contents of the publication are predominantly agricultural in nature, there are generally a number of well written summaries and reports of marketing activities that deal with refrigeration or refrigerated products. Examples of some of these journalistic accounts are "Marketing Costs for Lettuce" and "The Poultry Industry Prepares for Inspection", which appeared in the April issue; "Cooling Apples and Pears in Storage Rooms", "Food Donations to Needy People", and "Apple Research in the Northeast", in May.

Catalog on Passing Doors

▶▶PEAK seasonal activities are generally on top of the refrigerating enterprise before thought is given to improved access and closure devices which can and often do save considerable operating expense through conservation of refrigeration. Earlier in the year Jamison Cold Storage Door Co., Hagerstown, Md., offered a 16-page catalog on the selection of package-passing doors and tunnels for all purposes. One section detailed self-closing doors and curtains to minimize refrigeration loss while passing product into and out of low temperature rooms. Another topic of Section 6 of the illustrated catalog is the high volume handling of packages on gravity and powered conveyors.

Automatic Controls

▶▶FULLY illustrated and providing application information, a 60-page catalog No. 858 has been issued by Mercoid Corp., Chicago. The booklet presents data on relays, and both magnetic and tilting type mercury switches for automatic control of pressure, temperature, liquid and mechanical movement. For hazardous locations, the bulletin lists series DAE-50-60 Underwriters Laboratories listed devices.

Machinery Drives

▶▶LINK BELT CO., Chicago, offers an 88-page detailed, illustrated engineering data on the subject of chain drives, Book 2425. Publication costains tables and service factors, ratings, chain length and center distance computations, procedure for selection of engineered drives, etc.

Ammonia Bulletin

▶▶ANHYDROUS Ammonia, Technical Bulletin 52, has just been released by Sun Oil Company. The 2-page publication covers commercial and refrigeration grades and lists physical-chemical properties and specifications and other useful data for the purchaser and plant engineer.

Refrigeration Compressors

▶▶THREE basic types of compressors for the frozen food industry are illustrated and discussed in a technical article available from Freezing Equipment Sales, York, Pa. An updated revision of an earlier report, the 4-page article details a complete refrigeration cycle, with emphasis on compression ratios and suction gas superheat. Suggesting proper selections for highest performance efficiency, the report use both photograph and line drawing for this purpose.

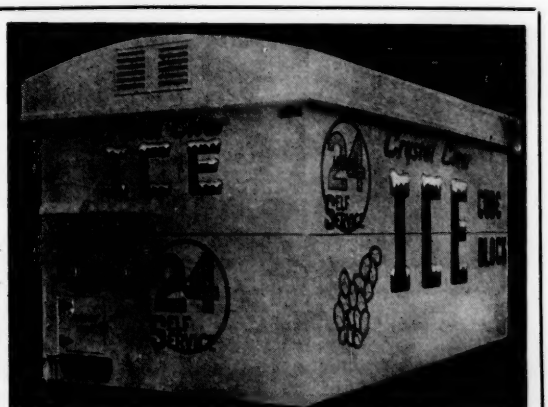
K. G. BROWN INTRODUCES THE NEW MULTI SCREW VENDOR FOR 1958

- An increased capacity of 40% over previous models.
- Multi Single Line Vending of any size package or block, regardless of the type of tie.
- These new vendors are now made in lengths up to 20' which will vend 268 10# bags plus 132-25# blocks out of the same delivery door, (400 Sales).
- Up to 5 various sizes of blocks or bags can be vended from this one vendor.
- Radical invention, trouble free, more storage space by design, lower operational cost.

NEW LOW COST 6' x 8' station vends 110-10# packages, or the "Junior", 3' x 7' station vends 90-10# packages using the new multi screw vendor.

ILLUSTRATED
9' x 16' Station vends 168-10# bags and 86-25# block.

K. G. BROWN MFG. CO., INC., MATTITUCK, N. Y.



DO YOU HAVE A TWO-STAGE PRESSURE OR TEMPERATURE CONTROL PROBLEM

MERCOID® HAS THE SOLUTION

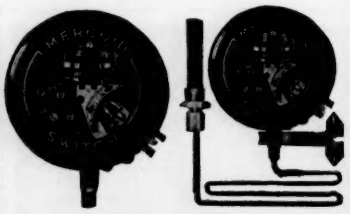
Mercoid DA-400 Series Controls are dual purpose controls (available for pressure or temperature) incorporating a single element operating two separate independently adjustable Mercoid magnetic mercury switches. Circuit arrangements can be supplied for various operations, a few examples are:

1. Close one alarm circuit at high setting and a separate circuit at low setting. Both circuits remain open between the high and low operating points of the two switches.

2. As an electrical interlock to open one circuit on a rise above, and the second circuit on a drop below the set operating point.

3. To provide two-stage control by opening one circuit on a rise and a second circuit on a further rise.

Pressure types available in 17 different operating ranges from 0-30" vac. to 300-2500 psi. *Temperature types* available in 11 operating ranges from -30-60°F. to 370-530°F.



All types are equipped with external adjustments and visible calibrated dial.

Our engineers are at your service—send in your control problem or

WRITE FOR BULLETIN CA-PT

THE MERCOID CORPORATION
4211 Belmont Ave., Chicago 41, Ill.

People in the News:

Recold in Mexico

Walter Bonezli is the General Manager for Recold de Mexico, S.A., a newly formed Corporation located in Monterrey, Mexico, which is manufacturing the complete line of Recold refrigeration and air conditioning equipment.

PFE Promotions

▸▸ Subsequent to the announcements in May INDUSTRIAL REFRIGERATION of personnel retirements and promotions, it has been learned that *E. F. Gaebler* has been appointed supervisor of technical refrigerating in addition to his previous mechanical and electrical responsibilities.

Raymond A. Toddhunter, formerly Assistant to General Superintendent of Refrigeration, San Francisco, and *Hubert Branham*, formerly Superintendent of Refrigeration, Pocatello, are now both titled Superintendent, Protective Services, the former at San Francisco covering SP territory, and the latter at Pocatello covering UP territory.

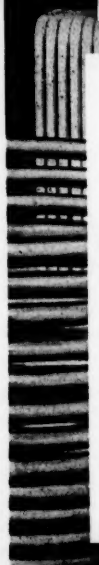
Baker Terminal Director

▸▸ At the annual meeting of the shareholders, Chicago's Produce Terminal Cold Storage Co., *William C. Baker* was elected a Director to fill the vacancy created by the death of Paul M. Binzel of Milwaukee. Baker has been vice-president of the company since 1950 and is a member of the Board of Governors, Chicago Mercantile Exchange, TRRF, and vice-president and director, NARW. Other directors re-elected are George E. Christians, Russell N. Crawford, Glen A. Lloyd, J. Sanford Otis, Edwin J. Ward and W. A. Sizer.

Correction on EEI Officers

▸▸ A release appearing in June '58 INDUSTRIAL REFRIGERATION lists the new officers of the Environmental Equipment Institute in error. The list was that of the 1957-58 officers. The new officers elected in April are President **R. J. Jacobson**, Cincinnati, Vice-president **Charles C. E. Harris**, Cambridge, General Manager **G. D. Wilkinson**, Princeton. The executive committee consists of **Monroe Seligman**, Union, **N. E. Miller**, Chicago and **Jack Shamroth**, Farmington, Conn.

PIPE BENDING EXPERTS



Coils, Headers, Fabrications

Completely modern metalworking machines, plus over 37 years of "know-how", assure the finest work to your exact specifications. Proven specialists in custom bending in any form, any metal, even stainless steel.

May we quote on your next job?

CHICAGO NIPPLE MANUFACTURING CO.
1997 CLYBOURN · CHICAGO 14

WORLD'S LARGEST MANUFACTURER
ICE CANS and BASKETS

● GALVANIZED
● WELDED
● RIVETED

Ohio Special Ice Cans are fabricated from finest quality Prime Galvanized Steel Sheets; formed accurate to size and straight for fast harvesting of ice.

Ice Can Grids or Baskets are designed to lift any number of ice cans and are Hot-Dip Galvanized after fabrication.

Write for Prices

OHIO GALVANIZING & MFG. CO.

ANN ST., NILES, OHIO, U.S.A.

Deaths of Industry Personnel

Wm. R. Robinson, president and treasurer of the Ohio Galvanizing & Manufacturing Co., Niles, Ohio died in Youngstown, June 4. He was 69 years old at the time of his death and had been ill for eight months. Robinson was a well known personality in the ice manufacturing and refrigerated warehousing business. His company supplied ice manufacturing plants with cans and baskets, and other specialties.

He was a popular and influential figure in Niles, and in April 1954 he was honored as the "man of the year" by the Niles Chamber of Commerce of which he was a past president, for his interest and contributions towards civic, economic and cultural interests of the community of Niles and the Mahoning Valley. As an associate member, he supported NAPRE activities for a quarter century.

Robinson is survived by his wife, Catherine Bentley Robinson and three daughters: Mrs. Jack Burtch, Mrs. John Watkins, Mrs. A. F. Compton.

Elmo McGee, president, Lone Star Ice Company, San Antonio died Monday, June 16 at the Baptist Memorial Hospital of injuries suffered in an automobile collision June 3.

Harry Dulles Jones, retired manager of the Cold Storage Div., Southern Ice Company, Charleston, S. C., died at his home in May. A native of Boydton, Virginia he is survived by his widow, a son, a daughter, a sister and a grandchild.

Leonard Allen Orth, retired ice manufacturing engineer died Monday June 16 at his home after a brief illness. Born in Denver, Colo., he was employed for a time at the Southland Corp., Dallas and later with American Service Co., San Antonio.

VAN RENSSELAER
H. GREENE
ENGINEERS

COMPLETE PLANT DESIGNS
INCLUDING BUILDING AND
EQUIPMENT

11 PARK PLACE NEW YORK 7, N. Y.

Rapid Ice Installations

SYSTEM EUGEN WILBUSHEWICH

FULLY COVERED BY WORLD PATENTS

Ice blocks of standard size, 56 to 340 lb., produced in 1½ — 2½ hours freezing time. No brine—no corrosion—no crane—no tank—no agitators—no thawing tanks. Negligible thawing loss. Exceptional melt resistance. Higher profits achieved. Simplified clear-ice production. Large sea-water ice blocks, without salt segregation for fisheries. Easily dismantled and maintained. Portable—very little space required. Considerable saving of power. Over 110 installations now are working to entire satisfaction. Rapid freezing process for the chemical industry. Plants of 1 — 500 tons capacity can be supplied with short deliveries.

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Postfach Zurich 23. Tel. 283233
Cable: "ICEFREEZING ZURICH"

Classified Advertising

All classified advertisements are payable in advance. Except for Positions and Help Wanted classifications, this section is reserved exclusively for USED equipment.

RATES: 20c per word; minimum 25 words. $2.00 per line for bold face headings: $15.00 per inch for line listings.

Ice Plants For Sale

FOR SALE — Prosperous ice business. No competition. Complete with land, building, equipment — York; 40 ton capacity. All top condition; good business; Central New York. Personal reasons. Write Box JL-2, % Industrial Refrigeration.

FOR SALE — Being forced to retire from this business, am offering my 35 ton ice and cold storage plant for sale, at a bargain. Located in Midwestern county seat, population 10,000; no competition. Oil field and tourist trade; plant now in operation. Write Box JL-4, % Industrial Refrigeration.

FOR QUICK SALE
Complete refrigeration system, capable 1700 ton refrigeration, consisting of 5 (duplex) Worthington ammonia compressors, each (duplex) with one 600 h.p. motor, exciters, transformers, condensers, receivers, purgers, cooling towers, tower pumps, traps, etc. Over $750,000 value new; good condition; daily operation, engineer maintenance; Attractively priced slightly under $200,000; Middle West. Pictures, details available. Inspection can be arranged. Born Company, 80 East Jackson Blvd., Chicago 4, Ill. WAbash 2-3299.

FOR SALE — SEE IN OPERATION
Complete cold storage engine room ammonia equipment including Frick 11½ x 8 — D.C. to 60 h.p., 400 r.p.m. Worthington 7 x 7 D.C. to 50 h.p., 400 r.p.m. Worthington horizontal high-low duplex d.c. to 100 h.p., 225 r.p.m. Vilter 10½ x 10½ belt drive by 100 h.p., 1750 r.p.m. Vilter 9½ x 7 belt drive by 30 h.p., 1200 r.p.m. All force feed lubricated; motors 220 volt 3 phase. MG sets, starters, panels spare parts included.
CENTRAL WAREHOUSE COMPANY
739 Pillsbury Ave. St. Paul, Minn.
Phone: MIdway 6-2831

USED EQUIPMENT—wanted & for sale

FOR SALE — Refrigeration equipment; ice equipment; new, used. Advise us your needs. Use "QUICKSEAL" — stops brine tank leaks; easy, efficient, economical. Born Company, 80 East Jackson Boulevard, Chicago 4, Illinois. WAbash 2-3299

CENTRIFUGAL PUMPS
Two figure 3650 3" x 4" — 7 Gould centrifugal pumps. All iron fittings, couplings and mechanical seals. Original service; 480 GPM. ethylene glycol at 60 psi. 25 h.p. Westinghouse motors 3530 r.p.m., drip proof, 3 phase, 60 cycle, 480 volts. Suitable in any clear liquid service. Purchased 1954. Operated approximately 2 years. Very good condition. Red Owl Stores, Box 657, Green Bay, Wisc.

FOR SALE
9x9 and 10x10 York, direct connected.
8x8 Frick V-belt drive 60 h.p.
6x6 York V-belt drive 25 h.p.
5x5 Frick w/evaporative condenser.
4 cyl. Carrier type 7G8 60 h.p.
(4) Carrier cold defusers, floor mounted, 3 h.p. each.
300 h.p. Westinghouse starter 4160 V. (new)
50 h.p. & 25 h.p. 1200 r.p.m. motors
JOHN F. CARSON
A & Venango Sts. Philadelphia 34, Pa.
GArfield 6-2221

FOR SALE — Vilter ammonia compressor, 7½ x 7½, with 25 h.p. electric motor, V belts. $750.00. A A A Steel, Mach'y & Supply Co., P.O. Box 6246, Dallas, Texas.

FOR SALE — 4x4 Frick, 8x8 York, $350.00. 20" x 10 ft. receiver. 3 ton ammonia blower unit. Write E. Niebling, 1546 St. Clair, Mt. Healthy, Cincinnati 31, Ohio.

FOR SALE CHEAP — 30 ton ice tank complete with 300# cans, agitator, and can filler. Also 175 metal food lockers — drawer and door type. Williamson Storage and Ice Co. Inc., Williamson, New York.

FOR SALE—AMMONIA
4—10"x10" 4-cyl. York duplex D. C. to 225 h.p. motor.
2—10"x10" 2-cyl. York D.C. to 100 h.p. motor.
1—9"x9" 2-cyl. York D. C. to 75 h.p. motor.
4—9"x9" 2 cyl. Frick compressors.
1—7⅞"x5" Frick booster.
2—7½"x7½" 2-cyl. York compressors.
1—5¼"x4¼" 6cyl. V/W York booster compressor.
1—5"x5" 2-cyl. York compressor.
1—3"x3", 1—4"x4", 2—5"x5 condensing units.
11"x22"x47"—11"x22"x51 ice cans.
From 20 to 100 ton ice plants, York & Frick.
ENTERPRISE EQUIPMENT CORPORATION
79 Alexander St. Box 502 Yonkers, N. Y.
Cable "ENEQCO" Phone Yonkers 8-8118-9

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...it's a
NEW
CONCEPT
in industrial
wall finishes
by...

• It's not a plaster . . . not a paint. Swift's Adcote wall finish was especially developed to provide industrial users with a high moisture resistant finish that is easy to apply yet has good adhesion to many different surfaces and presents a clean, white, uniform appearance.

You can use it over board type insulation or masonry surfaces. Use it on cooler walls, concrete, brick, concrete block or even apply it to damp surfaces. It shows good adhesion to many surfaces as tested by Swift and it offers chemical, rodent, vermin, and mold resistance.

Adcote finished walls are fire retardant and fully washable. Adcote is supplied as a dry powder and a liquid which are mixed together prior to use. Though usually trowelled on, spray or brush can be used.

A trial in your own plant is the best way to prove the superiority of this new Swift concept in wall finishes. Return the coupon for details on a trial order today.

ONE TRIAL IS BETTER THAN A THOUSAND CLAIMS

Swift

To Serve Your Industry Better

Swift & Company
Adhesive Products Department
Chicago 9, Ill.

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☐ Send descriptive bulletin.
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For

ICE MANUFACTURERS

exclusively!

DO YOU KNOW . . . Templets

REG. U. S. PAT. OFF.

Thousands of ice manufacturers throughout the country know from actual experience the super qualities TEMPLETS contribute, when added to raw water, in making quality ice and increasing production. They've used them for the past quarter of a century and have no thought of discontinuing their application. The re-orders we receive from these satisfied manufacturers prove conclusively that TEMPLETS are a highly esteemed product.

To the ice manufacturer who has never used TEMPLETS, may we explain that this product is a tempering ingredient that is made up in the form of a little green tablet. Two or three TEMPLETS dissolved in a can will improve the quality of your ice and leave no taste, no odor, no color.

TEMPLETS make your ice stronger and reduce its tendency to crack during cutting or scoring, and also give you a clearer cake. White butts, heavy cores and the cloudy veil that your customers don't like can be completely or partially eliminated. TEMPLETS help clear your ice of imperfections caused by raw hard water.

With TEMPLETS you can make more ice during the peak summer months in the same number of cans, thus increasing your daily production. TEMPLETS reduce cracking and breaking in the cakes, enabling you to freeze raw water at lower brine tank temperatures so you can use your cans more often and make more ice.

Start using TEMPLETS today. Once you've tried them you'll never again manufacture ice without them. They are very economical . . . cost you only about a penny a ton of ice!

Convince yourself how really good TEMPLETS are by trying them in your own plant at our expense. We will be happy to send you a sample of TEMPLETS absolutely FREE and with no further obligation if you will but send us the coupon below.

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Please send me a free sample and literature on **TEMPLETS.**

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Company_____

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Look for these features on the finest freezer doors

. . . Jamison Vap-r-tyt® Lo-Temp Door has unmatched record of dependability and economy

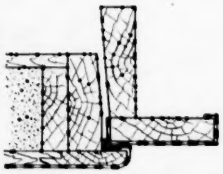
VAP-R-TYT METAL CLADDING

All metal seams locked and soldered

Penetrating bolt holes sealed

Prevents penetration of moisture under high vapor pressure

INFITTING DESIGN

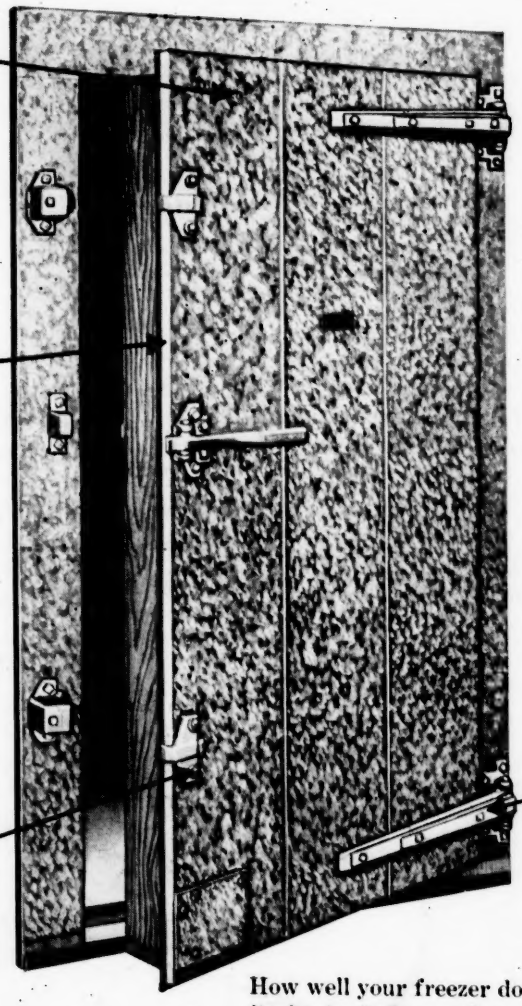


Requires less space than overlap type

Fits *into* wall

Requires shorter radius of swing

E-Z OPEN TWO-POINT FASTENER



JAMISON FROSTOP® (optional)

Keeps doors from freezing shut

Safe temperature range eliminates dangers of overheating or condensation

Permits selection of any temperature between 60°F and 120°F

Carries Underwriters' Laboratories Inc. label

ADJUSTOFLEX HINGE

How well your freezer door performs depends on its basic design and construction. Jamison Lo-Temp Vap-r-tyt doors—proven through years of service in all types of installations—are today's economical answer to modern freezer operation. Write today for catalog Section 4 to Jamison Cold Storage Door Co., Hagerstown, Md.

JAMISON

COLD STORAGE DOORS